THE ENGINEERING AND MINING JOURNAL.

HENRY W. TROY - CE. COLLINS & SHUGG. SC.

VOL. IX.—NO. 7.—THIRD SERIES.] NEW YORK, TUESDAY, FEBRUARY 15, 1870. [SINGLE COPIES 10 CENTS.

The Stetefeldt Furnace.

SINCE the discovery and exploration of the numberless mineral deposits in the Western States and Territories, no branch in metallurgy has received so much attention as the process of roasting ores of all descriptions. One can hardly look over a file of Mining Journals, or newspaper from some mining district, without finding descriptions of new devices for roasting ores, all of which claim to surpass everything else in this line, which was known before. The devices are as strange as they are many, and much time and money has been wasted to test impracticable inventions. Indeed, the high expense which the roasting in the old reverberatory furnace entails, was a strong inducement to invent some cheaper, and at the same time more effective, method. This is especially of importance where silver ores are found, which require a chloridizing roasting preparatory to their amalgamation. In such cases the expense of roasting is frequently more than one-half of the total expense of reduction, and consequently low-grade ores cannot be worked with a profit. But in spite of the necessity to adopt some improved and more economical process of roasting, it has been extremely difficult to introduce two inventions, which are based upon the most simple and rational principles—so simple, indeed, that it seems impossible to simplify them any more. We speak of the GERSTENHOEFER, or Terrace furnace, first introduced about six years ago at Freiberg, and the STETEFELDT furnace, invented three years ago at Austin, Nevada, but first introduced for regular working at the mill of the Nevada Silver Mining Company, near Reno, Nevada, in October of last year. The nature of these inventions can be expressed as follows:

GERSTENHOEFER discovered that sulphurets are completely roasted or oxidized if they fall against a current of hot air rising in a shaft, which is filled with shelves, so as to check and retard the fall of the ore particles at certain intervals.

STETEFELDT discovered that silver ores, no matter in which combination the silver occurs, mixed with salt, are completely chloridized if they fall against a current of hot air, rising in a shaft with no obstructions whatever to check or retard the fall of the ore particles.

It is a matter of course that in both cases a certain degree of fineness is required for the ore to be treated, and that a much coarser material can be successfully roasted in the GERSTENHOEFER furnace than in STETEFELDT'S.

We do not intend to enter here into a detailed description of the GERSTENHOEFER furnace, since that invention has been frequently laid before the public in several mining papers; but we will merely compare it with the STETEFELDT furnace, and point out the distinctions of the two inventions.

As a cheap chloridizing roasting is a vital question for the industry of silver mining in this country, it is evident that STETEFELDT'S discovery far surpasses that of GERSTENHOEFER in importance. But the question arises, whether the former, as constructed by GERSTENHOEFER, cannot be used as well for chloridizing as for desulphurizing roasting? We answer no. In the GERSTENHOEFER furnace only such ores can be successfully treated which, at a red heat during roasting, have no tendency to sinter or stick together.

But the small particles of a charge of ore mixed with salt are exactly in such a condition while roasting, as to have the greatest possible inclination to sinter and adhere to the shelves. They would thus soon obstruct the whole shaft, and prevent any further work. This has been demonstrated by actual experiments on a working scale.

From the foregoing, it is apparent that the application of the GERSTENTUFER furnace, even for desulphurizing purposes, is very limited, and that certain classes of ore must be entirely excluded from it. This is especially the case with galena ores, which are the most expensive to roast in reverberatory furnaces.

In STETEFELDT'S opinion, the shelves in the GERSTENTHOEFER furnace are perfectly superfluous, and all ores, even galena, can be desulphurized by dropping them through a plain shaft heated by fire-places below, if they are reduced to a sufficient degree of fineness. The escape of unroasted dust from the shaft is of no consequence, as a separate fire-place is constructed for the roasting of these suspended particles in the STETEFELDT furnace. Furthermore, the feeding machinery of the STETEFELDT furnace is based upon a principle entirely differing from that used with the GERSTENHOEFER furnace.

That a furnace without shelves is cheaper and easier to construct, more durable, less liable to get out of order, and that it requires less labor and skill to run it, must be conceded by everybody.

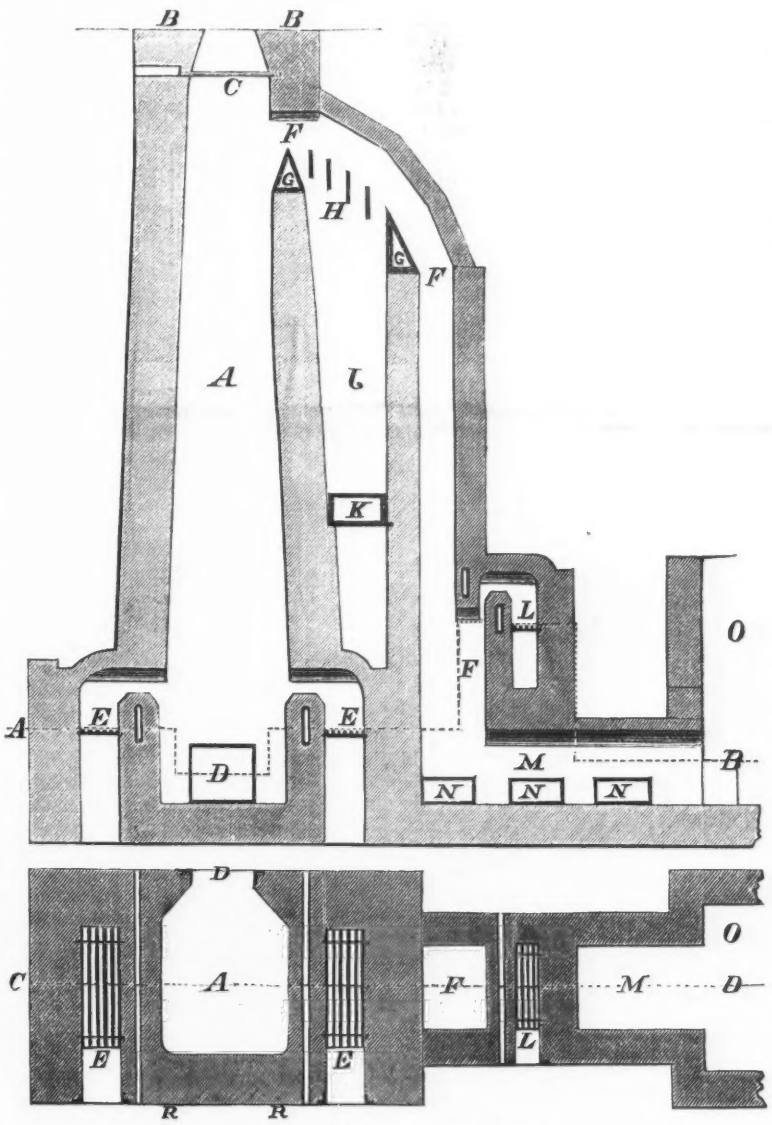
Much difficulty was experienced to provide suitable feeding machinery for the STETEFELDT furnace. GERSTENHOEFER'S apparatus, consisting of fluted rollers, which force the ore through slits in the top of the furnace, would not answer at all. The ore fell down in lumps, and arrived at the bottom of the shaft almost raw. The reason for this behavior is simply the tendency of the particles of all finely-pulverized mineral substances to adhere to each other if a slightly-compressed mass of them falls through the air. It is, therefore, necessary to introdnce the ore pulp so finely divided, that all the particles can be penetrated by the heat within the short time of their fall through the shaft. To feed the pulp with a blower, as it is done in KEITH'S desulphurizing furnace, was not considered desirable for the following reasons:

1. The fa l of the ore would be accelerated.
2. The draft of the fire-places would be impeded by the downward current of the air from the blower.
3. The formation of dust would be considerably increased.

The feeding machinery in its present shape can be briefly described as follows:

A hollow cast iron frame, kept cool by a small stream of water, rests on top of the furnace. In this frame is inserted a cast iron grate, which is covered by a punched screen of Russia iron, No. 0 for wet crushing, of the trade. Close to the punched screen moves, inside of the hopper, a coarse wire screen, No. 3 of the trade, which is fastened to a frame. The frame has flanches resting upon adjustable friction rollers outside of the hopper, and receives its motion from a crank, with 1¾-inch eccentricity. To avoid the motion of a stratum of pulp with the coarse screen, a number of thin iron blades are so arranged across the hopper that their lower edges reach close down to the coarse screen and keep the pulp in place. When the crank is set in motion, the meshes of the coarse wire screen cut through the pulp, and drive it through the openings of the punched screen. In this way the ore is introduced in a continuous stream into the furnace. The motion of the crank-shaft was variably tried in Reno, at from 30 to 70 revolutions per minute.

Construction of the Furnace at Reno.—The accompanying drawing will give a correct idea of the construction of the furnace at Reno:



THE STETEFELDT FURNACE.

A, shaft through which the ore falls.
B, top of shaft upon which the feeding machine is arranged.
C, damper, which is inserted when the screens of feeding machinery are exchanged.
D, door through which the roasted ore is discharged upon the cooling floor.
E, fire-place.
F, flue through which the gases escape near the top of the shaft.
G, triangular flue-bridges, of cast iron.
H, grate of cast iron plates, forming the bottom of flue F, allowing the dust, a small part of which settles here, to drop into the chamber, I.
K, discharge door.
L, fire-place, which heats the lower part of flue, F, and roasts the dust.
M, canal connecting with dust-chamber.
N, discharge door.
O, dust-chamber.

The main dust-chamber of the furnace at Reno is 24 feet long, 8 feet wide and 10 feet high. From there the gases pass under a dry kiln, 39 feet long and 7 feet wide. The two flues under the dry kiln are 3 feet wide and 4 feet high. A flue, 3 feet 4 inches wide and 4 feet 6 inches high, and about 180 feet long, leads from the dry kiln to an iron chimney of 2 feet 6 inches diameter on a hill side. The top of the chimney rises about 40 feet above the top of the furnace.

The fire-places and arches are built of the best fire-brick, the rest of common brick. All the walls are built double, with a space between. The furnace is well anchored with iron rails and ⅞-inch rods.

The following changes are contemplated in the construction of the furnace:

1. The use of oxide of carbon as fuel; the gas to be made out of charcoal in generators. The construction adopted for the latter will be similar to that of the copper refining furnace at Mansfield, Prussia. In this way a much more uniform heat can be obtained than by using wood, and labor will be saved, as the generators have to be charged only every three or four hours. Where wood must be hauled a considerable distance, charcoal will be even a cheaper fuel than wood.

2. The chamber, I, will be abandoned, and the flue, F, brought down directly on the side, R, R, (see ground plan) of the shaft.

3. A more extensive system of dust-chambers will be connected with the furnace.

Manipulation.—The ore is mixed with the necessary amount of salt on the dry kiln and crushed by a dry crushing battery through a No. 40 wire screen. A conveyor takes the pulp to a revolving screen, to keep out coarse particles, which may be caused by the breaking of a battery screen. The screened pulp is then taken by an elevator to the top of the furnace and discharged into a bin, which keeps the hopper of the feeding machine filled.

The fire is kept in all the fire-places as uniform as possible, and such a degree of heat is maintained that the roasted ore at the bottom of the shaft is red hot, but does not sinter or stick together. The ore is discharged when a charge of 1,000 pounds to a ton has accumulated, and cooled in the usual manner. At the same time, roasted ore is discharged through the door, N, where most of the dust settles, which is roasted by the fire-place, L.

Chemical Process in the Stetefeldt Furnace.—KUESTEL describes the chemical proceedings of the chlorination in the STETEFELDT furnace as follows:

"At the first glance, it would seem that, considering the

short time of two seconds, in which the falling ore is exposed to the flame, a perfect chlorination could not take place, especially if compared with the known facts apparent in the common roasting furnace—that is, that sulphurous acid is first formed under influence of a dark red heat, by aid of the oxygen of the air, while the metal, deprived of its sulphur, becomes an oxide. The oxygen of the air and of the oxide act on the sulphurous acid, converting it into sulphuric acid, which again combines with the metal oxide to a sulphate. The sulphate re-acts now on the salt, setting the chlorine free, and the formation of chlorides begin.

"This re-action and transformation requires time, which is not offered in STETEFELDT's furnace; but the chlorination is effected nevertheless, and very perfectly, with less salt, and in a few seconds. The chemical action is Stetefeldt's furnace is as follows: As soon as the ore enters the furnace, each sulphuret particle ignites, being surrounded by a glowing atmosphere; evolving, at the same time, sulphur, which, in presence of atmospheric air entering undecomposed through the grates, is converted into sulphurous acid, and the metal into an oxide. In contact with ore particles and oxygen, the sulphurous acid becomes sulphuric acid. This acid does not combine with the metal oxide to a sulphate, as is the case in a common furnace, or if so, only to an insignificant degree, on account of the temperature, which, nearly from the start, is too high. The sulphuric acid, therefore, turns its force directly against the glowing salt particles, setting free the chlorine. All these re-actions are, so to say, in *statu nascenti*. From the burning fuel steam is present among the gases, giving rise to the formation of hydrochloric acid. This hydrochloric acid not only originates directly by decomposition of the salt, but also from the chlorides of the base metals, which are formed in the upper part of the furnace, and again decomposed to oxides and hydrochloric acid in passing through the hot flame. The whole space of the furnace is then filled with glowing gases of chlorine, hydrochloric acid, sulphuric acid, sulphurous acid, oxygen, steam, and volatile base metal chlorides; all of them acting decomposing and composing on the sulphurets and oxides with great energy. The chlorine decomposes the sulphurets directly, forming chloride of metal and chloride of sulphur; it decomposes and combines also with oxides and sulphates. The hydrochloric acid does the same. The sulphuric acid decomposes the salt and oxidizes the sulphurets, while the oxygen creates sulphurous and sulphuric acid and oxides. The red-hot ore falls down, and, accumulating, continues evolving gases of chlorine, etc.

"Considering, now, a minute particle of ore (for only as such, not as a mass, can the ore be considered in falling) in a red-hot state, being attacked contemporaneously by all those gases which have free access from all sides; the principle of the Stetefeldt furnace is, that the chloridizing result must be effected before the particle reaches the floor. The dust, which passes the flame of the small fire-place, is even in a better condition for chlorination, being surrounded and acted upon longer by all the chloridizing gases which are formed in the main shaft."

Practical Results of the Stetefeldt Furnace. Chloridation.—A great number of tests were made during the first weeks of running the furnace at Reno. Between 88 and 92½ per cent. of the silver contained in the ore was found to be chloridized, all of which is easily extracted in amalgamation. The roasted dust discharged through the door N, is generally 1 per cent. better chloridized than the ore discharged from the main shaft. With an improved system of firing, the chlorination should never be less than 90, and we have no doubt that much higher figures will be obtained. Only very skilled roasters achieve such results in the reverberatory furnace. With ordinary care a charge cannot be burned in the STETEFELDT furnace, and the roasted pulp is in a splendid condition for barrel amalgamation, as it contains no lumps or sintered matter. Ores of the most various characters have been roasted with equal success. Even ore containing nothing but silver-bearing galena, was treated without any difficulty. In this respect the furnace is admirably adapted to roast ores with large amounts of antimonial and lead-bearing minerals.

Amount of Salt.—In reverberatory furnaces 10 per cent of salt is generally used. This amount may be safely reduced to 6 per cent. for very rich ores, and to 3 and 4 per cent. for low grade ores, in the STETEFELDT furnace. No experiments have as yet been made to determine if this percentage can be reduced still more. The difference in the percentage necessary is explained by the fact, that in the STETEFELDT furnace all the salt is decomposed and utilized, while in the reverberatory furnace a large percentage remains in lumps and entirely unchanged.

Fuel.—The amount of fuel necessary to heat the shaft depends very much upon the character of the ore. The more sulphurets an ore contains, the less fuel is required to roast it. The furnace in Reno uses, on an average, about two cords in twenty-four hours. With this amount, between 12 and 15 tons of ore are roasted daily, which is as much as the battery crushes. But the same fuel would just as well roast 20 tons of mainly sulphuret ores, which increase the heat in the shaft when introduced in larger quantities. How many bushels of charcoal a furnace with gas generators would require, we are not able to estimate reliably at present: but for most localities in Nevada, charcoal will be as cheap, if not cheaper than wood.

Labor.—At the mill in Reno eight men are employed to run the furnace. Of these, three are firemen, three discharge and cool the roasted ore, and two watch the feeding and elevating machinery. If gas generation with charcoal is used, the labor of three men can be saved, and the two men who watch the feeding machinery can very well charge the generator shafts. In this way, only five men will be required to run the furnace. Taking these facts in consideration, it is easy to estimate how much the STETEFELDT furnace cheapens the expense of roasting. In a mill of 20 tons capacity, in twenty-four hours, at least ten reverberatory furnaces would be required. The labor needed in twenty-four hours is, 2 carmen, 2 pulp-coolers, 2 oremen, 30 roasters; total, 36 men: fuel—at least 10 cords of wood in twenty-four hours; salt—10 per cent. or 4,000 pounds. In the STETEFELDT furnace these 20 tons are roasted with 8 men, (or 5 men, if charcoal is used as fuel) 2 cords of wood, and 2,000 pounds of salt. Saving by use of STETEFELDT furnace, every twenty-four hours: 28 men, (now, and 31 men with charcoal furnaces) 8 cords of wood, 2,000 pounds of salt. Besides this, the original cost of the STETEFELDT furnace is less than that of a corresponding number, in capacity, of reverberatory furnaces; it requires less repairing and does better work. We will mention, furthermore, an experiment made in Reno to try the capacity of the furnace. One ton of pulp was accumulated and put through the furnace in thirty minutes, indicating the furnace to have a capacity of 48 tons in twenty-four hours; 91 per cent. of the roasted ore were found to be chloridized.

The Moisic Iron Works, Canada.

An account based on information taken on the spot in October, 1869. By BENJAMIN SMITH LYMAN.

THE bloomary forge at Moisic is interesting from its being the northernmost iron works on this continent, and from its depending for ore on the magnetic iron sand of the sea beach. The works are at the mouth of the Moisy river, on the north shore of the St. Lawrence, near its mouth, some seventy miles west of Anticosti Island, and fifteen miles east of Seven Islands Bay, and are in latitude about 50½°, and longitude about 66°. The true spelling of the name Moisy (as seen on old French maps, and in the Edits et Ordonnances du Roy) has been corrupted by the fishermen of the coast, or by others, to Moisie, and the name of Moisic was given by the surveyor-general of the province to the township at the month of the river, in the belief that it was a good Indian name of the stream. He had the power to name the township, but of course had none to change the name of the river.

The river, for a couple of miles just above its mouth, is a mile and a-half wide, and runs towards the southeast; above that it is much narrower, and, with the same general course, is very crooked. This wide part is nearly closed at the mouth by a long, dry sand-bar, running northeast and southwest, the general course of the St. Lawrence; and the eastern part of the basin so formed is very shallow, indeed much of it is bare at low tide. The entrance of the basin from the sea (or rather the St. Lawrence, which is here seventy miles wide) is at the southern corner, by a narrow channel, which has eight feet or more of water at low tide, and the tide here rises ten or twelve feet. Near the end of the bar, on the right going into the basin or harbor, is the wharf or iron works. On the opposite side of the entrance, and close by on the same side, are two other wharves for fishing vessels. A railroad runs from the wharf a mile and a third along the bar to the iron works at the eastern corner of the basin. At the works are—a storehouse, a large building for the washing machines, forge fires, hammer, steam engines, boilers, blowing machinery, and machine shop, ten charcoal kilns of brick, a charcoal shed, a lime kiln and lime house, a stable and barn, and a brickyard, all clustered together near to each other. The village, of a dozen houses where the workmen dwell, is about a quarter of a mile from the forge building, on the northeast shore of the basin. There is a landing for wood close by the forge and charcoal kilns. The wood is brought down in summer, from some four miles up the Moisy, on large scows, fifty or sixty cords to the load. The scows are towed by a small steam tug that draws only three feet of water. In winter the wood is cut nearer to the forge (about two miles now) and hauled to it on the snow, and the wood near the forge is spared in summer for this purpose. It is almost all soft, resinous wood, but partly birch, and the trees are mostly rather small. The chopping is paid for at the rate of fifty cents (coin) a cord, and the wood is reckoned to cost at the kilns eighty cents a cord. The wood cut up the river belongs properly to the government, but the privilege of cutting it has been granted for the royalty of six cents a cord, which, however, has never yet been exacted.

There are ten charcoal kilns in a row, beginning about a hundred yards from the wood landing place; but two of them are unfinished. The eight finished ones are in the shape of a cylinder at the bottom, with a dome-shaped top. They are about thirty feet in diameter and twenty-five feet high, have walls a foot thick, are built each of forty thousand bricks, and will hold a hundred cords of wood a-piece, which yields four thousand bushels of charcoal. The two unfinished kilns are to have iron roofs, much flatter than the brick domes. Holes are left in the side walls, that may be closed with a single brick endwise, to regulate the burning. The charging and emptying are done partly by a round hole at the top, below a high wooden platform, and partly by a door at the bottom. The burning lasts twenty-five or thirty days, say, with the charging and discharging, one month for a burning, or twelve burnings a year with each kiln. The ten kilns would yield, then, about forty thousand bushels a month, or a little more than is needed by four forge fires. The charcoal is of very fine quality, much of it very beautiful, enough to make the eyes of a blow-piper glisten. The ten kilns need eight men to load and unload them, two men to watch, and a foreman, who oversees other matters too. The charcoal is reckoned to cost, in all, four cents and a-half a bushel. Last year there were only six kilns, and some pit charcoal was used.

The ore is gathered on the beach within say half a mile of the works on either side. The shore is a sand beach for fifteen miles above Moisic and for ten miles below, and the land rises from the beach, in three or four flat sandy terraces, to a height of some sixty feet, and then stretches back, almost level, some ten miles to the Laurentian mountains. Just above the beach the waves of great storms have cut the bank, of half a dozen feet in height, into low sand cliffs, in which are seen layers of blue black magnetic iron sand, from a mere film in thickness, up to three inches or more. These layers are sometimes separated from each other by very thin films of lighter colored sand, sometimes by a few inches, with the greatest irregularity. It is said that the average of these sands, found by digging long trenches through them, contains fifteen per cent. of magnetic iron ore. In great gales the sea washes these sands, and afterwards (as on the morning of the 5th day of October, 1869) there are on the beach great patches of nearly pure ore, as pure as it could be washed by man. These patches are of irregular shape and size, perhaps a hundred yards long and half as wide, and at short distances apart, all along the beach. They are of all thicknesses up to some three inches, and when you dig through the layer of light colored sand below them, a few inches thick, you find other layers of ore below. In fact, there is the same irregularity in the composition of the beach as in the sandbank above. After every gale there are fresh patches of ore on the beach, and the supply seems inexhaustible. A single patch, a hundred yards long by fifty yards wide, and averaging two inches thick, should yield about seven tons of ore. The ore is gathered at favorable times after the storms, and piled up in heaps on the bank, out of the reach of the waves. The experiment has been successfully tried of heaping up the poor sand below high water mark, and letting a common tide wash it. The first year the ore was noticed, its amount was immense—much greater than has ever since been seen on the beach at any one time. It is said that the sand has been found to have an average of a dollar's worth of gold in it to the ton.

In taking the ore, of course some impurities are dug up also, so that it has to be washed before smelting. The most troublesome impurity to remove is garnet sand, which is common here, and is heavier than the other sand mixed with the ore. The washing is done on a shaking table about twenty feet long and four feet wide, carried by four pairs of flanged wheels upon four rails crosswise of the table, and moved sideways some six inches, back and forth, by two rods joined to small cranks on a small bit of shafting. The table slopes gently towards the tailing end, and the bottom is about an inch and a half lower in the middle than at the sides. There are sides about six inches high, but the lower end is open. A workman with a wooden hoe pushes the sand up and down on the table as it shakes, until the impurities are washed away. The washing is not done at night; and one table supplies four forge fires for twenty-four hours, by working ten hours; and needs two men, besides a boy, to wheel in the ore. There are two such tables in the room adjoining the one where the forge fires are, and there is a fifteen horse-power steam-engine to run them. Near the washing machines is a water-wheel some sixteen feet in diameter by two or three feet wide; and a wooden aqueduct some two feet wide by a foot deep, on trestles, brings water to it from a swamp about a mile off. The wheel was put up to run the washing machines; but the water failed in a dry season, and the small steam engine was put up to take its place, and the wheel is idle. This last year, however, the water has been quite plenty enough. The washed ore is taken in a wheelbarrow, and thrown into a heap between each pair of forge fires.

There are eight forge fire places, all alike; but two are unfinished, and only four are in use now. They have a cast iron frame, and are three feet square and high, closed by a plate in front for a foot from the bottom, with holes in the plate for the escape of the slag, and with a shelf or hearth at the top of the plate, on a level with the tuyer. The tuyer is at one side of the fire, has a nearly semi-circular section with a radius of an inch, and is inclined at an angle of about fifteen degrees. The blast is heated in passing two long pipes like inverted U's, set side by side, in a chimney over the fire. These pipes are about eight inches in diameter, and rise about eight feet above the fireplace. The heat of the blast is not known exactly, but the pipes are said to be red hot. The air is brought to the fires by a large pipe a foot and a half in diameter from a pair of iron-blowing cylinders in the next room. Each cylinder is about seven feet long and four feet in diameter, is double acting, and gives about two double strokes and a half every minute. The pressure of the blast is about one pound to the square inch. The blowing cylinders are run by a steam-engine of about thirty-five horse power.

The forge process is the same as that in use about Ogdensburgh, the region from which the master-bloomers of Moisic came. The ore is all thrown on the fire in small quantities, from time to time, according to the judgment of the bloomer, until, at the end of three hours, he has gathered together a loop of about two hundred pounds, and some eighteen inches across, and six inches thick. The loop is then taken while hot to the hammer and hammered first into a shape about six inches square and two feet long, while the slag runs out in golden streams. It is then hammered into a bloom about four inches square, and three feet long, with a round bunch about six inches thick left at one end. This bunch is put into the fire again to be reheated, while the other loops are hammered, and is after that hammered out into a bloom about two inches square and three feet long, and is then cut off from the larger bloom. Both are called blooms, although the second, smaller one, has been hammered more than the first, and is almost as pure as bar iron.

There are two horizontal trip hammers, one of them dismantled at present, and each weighs six tons and a half. A sixty horse-power steam-engine for hammering stands in the same room with the blowing machinery. Adjoining this room is a small machine shop with a lathe.

A reverberatory furnace is already built in the room where

the washing is done, near the forge fires, and will be used for reheating the loop for the second hammering instead of putting it back into the forge fire.

The forge runs night and day except Sundays; and the four fires need four bloomers and one man to bring in charcoal and one hammerman, six men in all, every shift of twelve hours. The bloomers are paid three dollars and fifty cents a ton of iron, except two of them brought from Ogdensburgh to teach the others, and paid three dollars a day. The hammermen are paid a dollar and a half a day. Just now, besides the two master hammer men, two new men are learning to hammer, and are paid one dollar a day, and the other seventy-five cents.

The four fires make each eight loops in twenty-four hours, or all together about three tons of blooms a day. They began making iron near the end of October, 1867, and have made now some 1500 or 1600 tons, almost all of which is siill on hand. At first, only two fires were used; but last year for about six weeks six fires were in blast, the rest of the time only four.

The four fires need 1400 bushels of charcoal a day, on the average, or 36,400 bushels a month. A greater bulk is needed than if it were heavier, that is, made more from hard wood: but this lightness of the fuel is thought to give a better quality to the iron. The charcoal is said to weigh fifteen pounds to the bushel.

Near the charcoal kilns is a limekiln. The limestone is brought from Seven Islands, about twenty miles off, and the lime is used for making mortar. Bricks are made in a brickyard close by the forge, and good material for them is found there in some layers of clay among the sand. A very fine sixty-ton iron screw-steamer of eight feet draught belongs to the establishment, and plies constantly between it and Quebec or Montreal throughout the season of navigation. The land belonging to the iron works is about five square miles, of which about two is a peat bog. All foothold for grog-shops is, therefore, kept at some distance from the forge, and nothing stronger than spruce beer or tea is drunk there.

There are now in all eighty-five men and boys (very few boys) and twenty-two horses employed by the concern. Last winter there were two hundred and fifty men employed, about a hundred of them choppers, who go back to the south shore of the St. Lawrence for the summer. Nearly all the workmen come from there, and either cross in schooners, or, when a large number is wanted at once, as for wood-chopping at the beginning of winter, the steamer calls for them at some port agreed upon beforehand. In any case, they pay for their passage across. The wages of common laborers vary from sixteen to twenty dollars a month—mostly about sixteen dollars, and they find their own board, which is eight or nine dollars (say eight and a half) a month. House rent is given free to those who take houses. Better workmen get from twenty to twenty-five dollars a month. The wood-choppers are thought to be best paid at fifty cents a cord, for they can cut two cords a day—rarely three.

The supply of wood may be considered almost inexhaustible by any ordinary iron works, for the Moisy river comes down perhaps a hundred and fifty miles, wooded in most places along its banks and for some distance back. Although there are falls in its course, the wood could be floated down and caught by a boom below. The region through which the river runs is not only perfectly wild now, but must always be so in great part, as it is rocky and mountainous, to say nothing of the climate. The climate at Moisic, on the shore of so large a body of water as the lower St. Lawrence, is, in the early winter, milder than the climate of Montreal, much further south; but the great body of drift ice that stays in the river and gulf until May, makes the spring very backward. The summer is short, but plants grow fast in it and ripen quickly, so that fine potatoes, as well as oats, ripen well, and the soil, though rather sandy, is not unfavorable. Snow does not come in any quantity until December, or even Christmas, but the ice does not go until May.

There is then no navigation for five or six months in the year. The mail is carried on foot, once a month, through the winter, about two hundred miles, to Bersimis, the nearest post-office on the north shore. The trip is made by the mail-carrier on snow-shoes, commonly in nine days, but sometimes in seven. He is paid eighty dollars for the round trip, mostly by the iron-works, but the workmen pay twenty-five cents for each letter they send.

The white population of this north shore is very thinly scattered, and almost wholly of French descent, and fishermen and hunters by occupation. There are scarcely a dozen houses within fifty miles of Moisic, up and down the shore, and there are none inland.

There are a few Indians, of the tribe called Montagnés, that frequent this region; but through all of the year, exeept a short visit in the summer, they are back in the mountains hunting. They sell their furs to the agents of the Hudson's Bay Company, which has a monopoly of all trade with them. Now and then one or two of the Mic-Mac tribe of Indians come down from the north, a couple of hundred miles, perhaps as guides to some French missionary. Two such Indians, while on a visit to Moisic, saw a horse for the first time in their lives.

They thought him some terrible wild beast, and were going to shoot him. Away from Moisic, horses are extremely rare on this coast, and in the winter dogs are used to drag sledges. There are no roads except along the shore, and a few rough footfaths or carries (portages) inland for canoe-travellers. The rivers are indeed the great highways, for the woods are thick and hard to pass through, while the rivers head up so near each other that it is possible to go almost anywhere in a canoe with short carries.

American Mining and Metallurgy from a Foreign Standpoint.

Notes of a Tour of Observation, by Professor F. STAPFF, of Sweden, Special Correspondent of THE ENGINEERING AND MINING JOURNAL.

IV.

DURING my journey, I have gradually come to the opinion that American pig, though made in many cases of faulty ores, and without sufficient care, is nevertheless better on the whole than would be expected *a priori*, and better than it is often pronounced to be, in the old country, and even here. It is true, the best American charcoal-iron is at present inferior to the Swedish; but it appears to be superior to the very best English; and the average common American iron excels common English. Experienced American railroad men inform us that home-made iron rails are more durable than imported English. Cast-iron wheels made at Catasauqua and other places in this country, have almost supplanted the wrought-iron wheels which, in most countries of Europe, are still considered to be inevitable, at least for passenger-cars. The Sligo "fire-box-sheets," made from the Juniata charcoal-iron, are renowned for their strength and durability. SCHONBERGER & Co. make horse-shoes (a very delicate proof) directly out of *mock-bars* from Missouri and Lake Superior ores — coke-pig-iron, which has passed through the ELLERSHAUSEN process. The grey foundry pig-iron, which at Kingsland is produced from Iron Mountain ores with raw Illinois coal and Pittsburgh coke, was broken by eighteen thousand pounds pressure per square inch, whilst grey Irondale charcoal-pig, made of the same ores, bore fourteen thousand pounds. Tests made at the Scott foundry, Reading, Pennsylvania, proved the breaking weight per square inch of refined "Catasauqua" wrought-iron to be sixty-one thousand six hundred pounds; of double refined "Catasauqua" rivet, sixty-eight thousand four hundred pounds; of double refined (stay-bolt) "Catasauqua S. B," seventy-four thousand six hundred pounds. Axle-shafts of common sizes, for railroad-cars, made at Sligo, (LYON & SCHORB) were broken by four and five blows of a weight of one thousand five hundred and twenty pounds falling from a height of twenty-five feet upon the middle of the horizontally-fixed axle. The distance between the points of support was about four feet. I hope that these data, gathered at few but very heterogeneously conditioned American works, will justify me to your readers for my opinion expressed above. The following improvements in the management of American blast-furnaces of wide reach and general applicability, are to be urged:

1. Frequent assays or analyses of ores, lime, coal coke, iron and other furnace products, to determine the proportions of those substances which influence the metallurgical processes, and the quality and value of the iron. Mere "practical men," pretty well acquainted with the symptoms and consequences, but not always with the true reasons of anomalies in their business, commonly underrate the value of exact analyses and assays, since they do not exactly know what to do with those figures which have no symbol ($) before them; and they are seldom fully acquainted with the present extent and certainty of scientific guidance upon practical fields. In their eyes, assays and analyses of ores, lime, coal and iron, etc., are not much better than the indulgence of expensive fancies. But heavy sums, wasted by fruitless experiments on a large scale, would have been saved, if the plans of such experiments had passed the review of scientific critics before their execution was attempted. The laws of Nature can neither be overthrown by capital nor by energetic perseverance and audacity; and schemes contradicting these laws, though their defects may be veiled to many a "practical" understanding, would not stand the test of a plain, scientific examination, and must prove failures. Many brands have been spoiled, and the reputation of establishments has been injured for years, by mistakes which a simple assay would have explained at once. The quality of the products from many establishments could be directly improved, if by some few exact assays, all raw materials were examined, and the injurious ones excluded. On the other hand, if the assaying of raw materials and products is to become an element in the management of American metallurgical establishments, (as it is already at many European ones) it is necessary to avoid circumstantial, wearisome and expensive analytical methods. The great quantity of assays to be made in such cases requires practical methods, which are exact, easily made and cheap. Fortunately, Professor EGGERTZ, of Falun, has discovered methods for assaying iron ores, iron, steel, etc., which satisfy these conditions, and which are in daily use at the Swedish iron-works and elsewhere. [The writer will be prepared to execute such assays, at 312 South Fifth street, St. Louis, as soon as the necessary apparatus shall have arrived from Sweden.]

2. Careful sorting of the ores used, so that the bulk to be carried and smelted is diminished, and minerals pernicious to the quality of iron are removed, as far as practically possible. This sorting could best be done at the mines, the expense to the mine proprietors being compensated by higher charges for the ores thus improved in quality. At some places, coke of higher quality than at present could be made of the same stone-coal, by the use of suitable coal washing machines and cooking furnaces. This improvement also should be put in practice rather at the coal mines than at the furnaces. Limestone should be carefully chosen, according to practical and analytical tests. The quality of iron made of the very best ores, with the best coke or coal, is often deteriorated by noxious substances in the limestone used as flux.

3. The ores should be crushed before they are charged, particularly if they are very dense and hard, as most magnetites and specular iron ores are. The less high the furnaces are, the more necessary is the crushing of the ores; and at some places, also, the fuel and lime should be used in smaller pieces than they are now. Crystalline limestone is so strong that it never should be used in lumps of a cubic foot or more.

4. By a diligent roasting of the ores, especially magnetites, specular iron ores and carbonates, not only a less red-short iron would be produced, but at the same time, also a saving of coal effected, and a more regular furnace-run obtained. It has already been mentioned, that in Sweden all ores (bog ores excepted) are well roasted, whether they contain visible pyrites or not, and it is supposed that the high quality of the Swedish iron and the moderate consumption of charcoal for its production, greatly depend on the carefully conducted roasting process. The most perfect roasting is made in kilns fired with furnace gases. By covering the furnaces, probably so much gas can be caught as is necessary for firing boilers, blast reheating furnaces, and roast-kilns, provided that all raw materials put in the blast-furnaces are pretty dry and, if possible, the limestone burnt. At the furnaces of Ougrée, in Belgium, not only the limestone, but also the clay-slate, which there is an ingredient of the charges, are burned beforehand, and it is easily to be understood that the gases caught from the Ougrée furnaces must be dry, not smoky, easily combustible, and of a high re-heating power. It is also evident that the consumption of fuel in the furnaces must be reduced by the use of burnt limestone and dry raw materials, all the carbon being saved which, in the opposite case, is required for the reduction of the carbonic acid disengaged from the limestone, and all the heat being rescued which, at present, is made latent within the furnaces by the evaporation of water.

If the introduction of roasting-kilns fired by furnace gases occasions gas bells over the furnaces, one should take care to build these bells after plans which permit a systematic charging of the furnaces without the employment of many hands.

All the points above named should not be applied to *all the* American furnaces previously mentioned, or to any one of them especially; on the other hand, improvements could be made here and there which are of so special a character, or so local in applicability, that I must desist from enumerating them.

Perhaps it may be objected that the high American wages impede the application of the improvements here proposed, and of many others, with which the American furnace-men likewise are well acquainted. Allow me to reply, that the number of hands now employed at American furnaces would not be much increased by the introduction of most of the improvements here spoken of, if suitable methods, machines, and apparatus were chosen; that the expenses connected with these innovations would be returned with heavy interest, in saving of fuel and higher value of the products; that, finally, American wages are proportionate to the American customs duties, which (freights not even taken into calculation) permit the American manufacturers to sell at prices *at least* fifty per cent. higher than the European.

The Missouri *Democrat* recently published the following estimate, showing what would be the price of Scotch pig iron imported *duty free* to St. Louis:

Price per ton (gold)	$11 50
Commissions	0 31
Insurance to New Orleans	0 16
Freight to New Orleans (20s.)	4 84
Transfer and Commissions at N. O.	1 11
Freight to St. Louis ($4 currency)	3 32
Insurance to St. Louis	0 29
Total, gold	$21 53
Add 21 per cent. premium	4 52
Total, currency	$26 05
Adding the duty of	9 00
We have the price	$35 00

or more than three times the cost of the iron in Scotland. But the wages in Missouri are *not* three times as high as in Great Britain.

If we further reflect upon the inexhaustible stocks of easily-accessible raw materials in America, and upon the low rates at which they are or could be exploited, (in spite of high wages), we are forced to the conclusion that nothing but the excessive distances between the localities of the different raw materials necessary for a certain manufacturer, or misplacement of the establishments, can delay a development of the American iron industry in accordance with the age. Capital and labor can not be said to be wanting in America.

In speaking of the mistaken location of establishments, it is my duty to remark, that most of the works visited seemed to be placed with much sagacity and foresight, with regard to the geography of the country, to the situation of iron and coal mines, to the canals and railroads existing and projected, and to the skilful use of a given ground, and the consequent disposition of the whole in accordance with topographical features. I sometimes have heard complaint of the mass of the American iron works grouped around Pittsburgh, and not along the Mississippi river south of St. Louis; but I think that those criticisms are not well founded. About the same quantities of Missouri ore and coke are used for the fabrication of pig iron. Consequently, if one makes pig iron, the expenses for freight to the works will be about the same, whether works be established around Pittsburgh or around St. Genevieve. But if rails are made, or if the pig iron is worked up into articles of any other description, locations among the Pittsburgh coal fields possess a distinct superiority over those around the iron-bearing mountains of Missouri, particularly if the wares fabricated are principally consumed in the Eastern States. This relation is at once changed, as soon as, not Pittsburgh coal, but Illinois coal, is used. Then, no more favorably situated iron country can be conceived than the Mississippi valley, with its inexhaustible resources of coal on one side, of ore on the other, and with the Mississippi and many navigable tributaries as transport ways. The Illinois coal is commonly disdained; but it is mined at comparatively very few isolated places, where coal of very different qualities is won. Indeed, coal fit for blast-furnace processes will easily be found in Illinois, and if there is no other defect than shale, with or without pyrites in the coal, coal-washing machines and good coking furnaces will overcome this difficulty.

[TO BE CONTINUED.]

MINING REVIEW FOR 1869.

[From the San Francisco Commercial Herald.]

[CONTINUED FROM PAGE 69.]

NORTHERN AND NORTHWESTERN COUNTIES OF CALIFORNIA.

Mountainous, remote, cut by fearful cañons and covered by vast and gloomy forests, for a long time the coverts of fierce and hostile Indians, mining in this region has been much retarded. Though partially explored and sparsely populated at an early day, not until within the past few years have any considerable improvements or permanent settlements been effected in this section of country; one of the principal causes operating to discourage its earlier development being the opposition offered on the part of the aborignes to its exploration by the whites. For years a deadly warfare was kept up between these two races, many of the pioneer miners having lost their lives in the conflict. Obliged, however, to succumb at last, the Indians, or such remnants of these once powerful tribes as are left, have been mostly gathered together upon reservations set apart for their use, where they can no longer assail, or be themselves exposed to the assaults of the whites. With this hindrance removed, these northern counties have been more thoroughly explored, and found to abound in mineral wealth of every description. Simultaneous with these discoveries population has flowed in, and the business of mining been carried on very extensively along the creeks and rivers, though comparatively little has yet been done in the way of vein-mining or in the working of more deep-seated deposits, if these latter shall be found to exist in the country. Quartz lodes are known to be both rich and abundant; and while the more accessible bars along the rivers have been pretty well worked out, there still remains another class of bars in the form of elevated benches, marking the former channels and levels of the streams. Some of them are extensive, and rich in gold, but owing to their position, they can be worked only by water brought through ditches of considerable length, and which it would therefore require a good deal of money to construct. Latterly several works of this kind have been commenced, some of which have already been brought to completion, affording the means for washing and consequent employment for a large number of miners. Numerous quartz veins have also been opened, and a good many mills put up and run with success, a much larger proportion of these establishments being kept running here than in the earlier settled mining counties. Several mills erected for the purpose, have also been engaged crushing cement with satisfactory results. Deep banks of auriferous gravel, and beds of cement have been found in many places, leading to the construction of tunnels and the practice of hydraulic washing. Roads have been built over the mountains, facilitating the introduction of machinery and other supplies; and, viewed altogether, it must be conceded that these more distant portions of the State offer many inducements to both labor and capital seeking employment.

SOUTHERN COUNTIES.

While there have been no important mineral discoveries made during the past year in this quarter of the State, some mines of fair promise have been found in new localities, while many of those previously located and in course of development, have yielded better returns, or otherwise exhibited greater evidences of wealth than ever before. Los Angeles county, while it can justly claim the credit of containing the first gold mines ever worked in California, can also point to a greater variety of useful metals within her borders than any other county, this being the only county in the State containing any large and known deposits of tin. In March, 1842, one Francisco Lopez, a native of California, collected nearly twenty ounces of gold on San Francisquito creek, in the Sierra Madre, thirty-five miles northerly from Los Angeles. For the next four years this placer was worked by various parties, who took from it between six and eight thousand dollars per annum. Some seven years ago, quite a number of good-sized gold, silver and copper-bearing lodes was discovered in this same range of mountains, a short distance east from the site of this early discovery, and sixty miles northeast of Los Angeles, with which place these mines are connected by a good wagon road. The Soledad district, in which they are situated, is well supplied with wood and water, affording good facilities for working the mines, upon some of which, more especially the copper veins, a good deal of work has already been done. In this vicinity, and at other points along the range, some placers have also been found, in which quite a number of hands have been able to make fair wages during the wet season.

Several mills have been put up in the Soledad district, some of which, as well as a number of arastras, are running with moderate success. The Eureka company, running a ten-stamp mill, recently cleaned up 140 ounces of gold, after an eight days' run, and report, earlier in the season, a clean-up of $1,295, from a crushing of fifty tons of ore, which may be accepted as fairly representing the average results obtained by this company, who have since erected a ten-stamp steam mill, the first being driven by water. A pretty thorough exploration of their mines seems to show that they have a good deal of twenty dollar ore. An extremely rich lode of argentiferous galena has been found within the past few months in the Yellow Pine district, not far from Soleded. Some of this ore assays ninety per cent. of lead and silver In December last, surface quartz, abounding with free gold, was found at the head of Placeritos, forty miles northeast of Los Angeles, and in a locality not before worked.

In the month of September last, some limited surface deposits of gold were found at a point thirty miles westerly from San Bernardino, near the top of what is known as the Lytle creek, or Cocomungo mountain. The dust is coarse though not very abundant. The locality is without timber, and affords but little water for washing. Both vein and placer mines were discovered, some ten years ago, in Holcomb Valley, San Bernardino county, about thirty miles easterly from the town. Several quartz mills were subsequently erected here, which, after running with variable success, are now doing moderately well. In the placers some fifty men continue to make small wages. Should the project for bringing in a larger supply of water be carried out, it would doubtless have the effect to increase their earnings, and probably add, also, something to the present population.

A number of deep placer claims were opened on the west bank of the Colorado river, in San Diego county, several years since. The shaft in the principal claim had reached a rich gold-bearing stratum, when, being near the river's edge, the water came in so fast that the owners were obliged to abandon it, having no adequate appliances for pumping it out. More recently, lodes bearing the precious metals have been found near the city of San Diego, ores from which have yielded very handsome assays. Copper and other of the useful metals are known to exist in this county; and but a month or two ago, a rumor prevailed that rich placers had been found at a point only sixty miles from the town, some small lots of dust and chispas worth $10, having been brought in from the reported locality in confirmation of the rumor. At last accounts from that quarter, the precise locality of the discovery had not transpired.

Lying east of the Sierra Nevada mountains and at an elevation ranging from 4,000 to 15,000 feet above the level of the sea, are

INYO, MONO AND ALPINE COUNTIES,

all abounding in lodes promising great wealth of the precious metals. While but little work has been done the past year in Mono, and no large amount in Alpine county, mining in Inyo has exhibited more animation, a great number of claims having been worked, the most of them on a small scale, in the Cerro Gordo and one or two other districts. Operations upon the Dunderberg tunnel, situate on the easterly slope of the Sierra Nevada, Mono county, have been kept up throughout the year, this being the second year that they have been steadily prosecuted. A large, and what would appear to be very rich silver-bearing ledge, exists at that point, it having a thickness of twenty feet on the surface, and having been traced by the croppings for over a mile. The tunnel—in over 600 feet—has cut the vein at a depth of 250 feet beneath the croppings, at which point it discloses a heavy body of high grade ore. Being in a section of country abundantly supplied with fine timber and water, the mine can be worked and the ores beneficiated at small cost, rendering it probable that this will soon prove to be one of the most valuable mining properties in Western Nevada. There are promising mines in the Brodie, the Blind Spring, and several other districts in Mono county, but for the past year or two very little has been done with them.

Of mining pursuits in Alpine county, we have, for the past year, a fair degree of progress to report, the inhabitants having, with commendable perseverance and industry, managed to keep work going upon a number of claims, and to finally enlist a considerable amount of foreign capital in mining enterprises of divers kinds in the county. Thus aided, operations, for a time suspended, have been resumed and prosecuted with industry upon several early locations; this category embracing the Tarshish, Leviathan, Mt. Bullion, Imperial, Globe, Mountain, Pennsylvania, Morning Star, Monitor, and several other mines of note or good promise. Upon some of these claims a large amount of work has been done, revealing, in several instances, fine bodies of ore. Owing to the intractable character of the ores, however, much trouble has been experienced in the attempts made at reducing them in the district; leading to the shipment, latterly, of considerable quantities abroad for sale or reduction. Into the Mountain claim, a tunnel has been run 1,500 feet, cutting it at a depth of more than 1,000 feet below the croppings. On the other claims, the tunnels vary in length from 200 to 1,000 feet, besides which, many shafts have been sunk, and other exploratory labor performed. With this freer application of capital to the development of the mines and the erection of mills and furnaces for the treatment of the ores, the prospects of this county may be accounted good, considering the natural facilities that exist for the extraction and reduction of the ores.

In Inyo county, the greatest activity in mining the past year has been in the mountain ranges on either side of Owen's Valley, the principal subdivisions of which consist of the Inyo, Keys, Russ, Lone Pine and Coso districts, forming an unbroken mineral belt over one hundred miles in extent north and south, and reaching easterly an indefinite distance, mineral discoveries continuing to be made constantly in that direction. On the authority of Mr. Melville Atwood, one of our most intelligent and reliable mineralogists and mining engineers, the metalliferous veins in that section may be classified as follows: auriferous, or gold-bearing quartz, veins carrying silver alone, the metal being in combination with copper, lead, sulphur, &c., and veins of argentiferous galena, containing both the sulphides and carbonates of lead.

In the Inyo and Russ districts are many gold-bearing veins of apparent value, parcels of ore from which have milled from $50 to $60 per ton. No extensive developments, however, having yet been made upon them, both their permanency and productiveness are still open to question. The deposits of argentiferous ores having been more extensively developed, are known to be very large, as well as rich, in silver, but they require to be reduced by smelting. They are very numerous, forming, in places, a perfect net-work, the veins varying in thickness from one to eight feet. With proper assorting, the ore will assay from $150 to $600 per ton, in silver. These veins could be worked by small companies of miners with profit, if only they had a market for their ores at one-half their real value. But with an insufficiency of reduction works, and no other market at hand, they cannot just now be worked to advantage. The third class of veins—the silver lead ores—which are capable of being assorted and smelted without dressing, yield from thirty to one hundred and fifty ounces of silver per ton, besides the lead. This ore being plentiful in the several districts, affords a sufficiency of the requisite material for concentration of the silver in treating the other description of ores; a point of moment in sections where the latter are abundant.

The principal mines in this section, as indicated by present explorations, are the San Felipe, the Santa Maria, or Freiburg No. 1, the Ignacio, the Freiburg No. 2, the Front, Belmont, and the San Lucas—all having a northerly and southerly strike. The San Felipe, at a depth of 208 feet, where cut by a tunnel, is over fifteen feet thick, the Freiburg No. 2 being three; and the Santa Maria, in places, over thirty feet thick. These are all situated in what are known as the Cerro Gordo settlements, lying six miles east of the head of Owen's Lake, above which they are elevated nearly 4,000 feet, being 7,000 feet above the level of the sea. Near these mines a smelting establishment has been erected, known as Belshaw's furnace. There are many other similar works in this region; but the most of them are small, the above having a capacity to reduce fifteen tons of ore per day. Until recently the most of these veins were worked by Mexicans, who, having had considerable experience in this method of reduction, have found this a lucrative business. Some of these people smelt their ores in rude furnaces, erected and managed by themselves, while others have disposed of them to the Belshaw works.

Among other leading advantages enjoyed by the mines in the mountain ranges adjacent to Owen's Valley, are proximity to a good agricultural district, there being in this valley over 200,000 acres of good grain and grass land,—a large portion of it inclosed and under cultivation. Hay, grain, and vegetables of all kinds are cheap and plentiful among the farmers along Owen's River, as well also as fresh meat, butter, &c., this being a good grazing as well as farming country. Owen's river affords a considerable amount of water-power, which could easily be made available for the propulsion of machinery, to which purpose a portion of it has already been applied. The climate in this region is mild, no snow ever falling in Owen's Valley, and not over a foot or two in the mountains about the mines. A good deal of capital is now being invested in this region, and when the railroad shall approach it more nearly, as will be the case very soon, it may be expected to add largely to its already very respectable shipments of argentiferous lead. Tons of this metal are now being sent to San Francisco every week, the assays of which range from $300 to $600 in silver to the ton. Nearly every steamer from Los Angeles brings a quantity of this material, consigned to San Francisco, single lots often amounting to forty or fifty tons.

Nevada.

DECREASED PRODUCT OF BULLION, AND ITS CAUSES.

While a great deal of prospecting and other preparatory labor has been performed in this State the past year, the actual amount of bullion turned out has fallen considerably short of the annual average during the period of largest production, the yield having scarcely exceeded that of the previous years. The cause of this diminished production is to be found in a variety of circumstances, peculiar and temporary, being such as are not likely to prove of long continuance or again to occur. At different times, throughout the year, and in various localities, the owners of the more productive mines, left short of help and threatened with violence through labor-strikes and combinations, found it expedient to curtail operations; while others who had intended embarking in new enterprises, were prevented doing so by the exactions and menaces of the labor-leagues and unions existing at the principal mining centres. Moneyed and business men visiting the country with a view to investing capital or embarking in trade or other pursuits, alarmed at the unreasonable demands of the miners and other manual laborers, declined doing so; thus leaving the country without that aid and enterprise which it so greatly needed. Having passed through a long and rigorous winter and reached the season most auspicious for the inauguration of new enterprises and active operations, an unusual stringency in the money market ensued, cutting off all succor from abroad and leaving the country without the means for the energetic development of its resources. Thus, many districts abounding in good mines, were left without mills or other facilities for opening them up and rendering their wealth available. During the summer a disastrous fire occurring in the mines at Gold Hill, checked work in several of the most productive claims on the Comstock lode, materially reducing the quarterly return of bullion for that district. Other special, but minor causes, might be adduced as tending to still further retard the progress generally anticipated for the business of mining in this State at the opening of the year, such as the protracted rigors of winter, the reaction consequent upon over-speculation, &c.

PROGRESS MADE AND GAINS EFFECTED.

Notwithstanding the product of the precious metals has been less in this State the past year than was at one time expected, it has by no means proved a year of retrogression or inaction. Never before have such extensive and thorough explorations been carried on in this quarter, the entire eastern part of the State having been subjected to a searching examination, resulting in the discovery of many new and important mining localities, and in the formation of several additional districts, in some of which, mills and smelting works have been erected, roads constructed, and considerable towns built up. In many sections of the State, where former operations had languished, or been wholly suspended, they have been resumed, and generally with cheering prospects of success. Deserted districts have been revisited, neglected mines re-opened, and mills long idle have been started into operation; while others, found useless in certain districts, have been removed and set up in localities where their earnings have since resulted in profit to the owners. The immense mineral wealth of Eastern Nevada, before resting largely upon mere conjecture, has during the past year, been demonstrated to have an actual existence. In every mountain range throughout this extensive region, metalliferous deposits of value have been discovered, the other natural resources of the country also proving greater than was expected. Fertile and well-watered valleys, broad meadows, grassy hills, and heavily timbered mountains have been found where only barrenness and aridity were looked for. In a land long supposed a worthless desert, many extensive tracts have been found well adapted to tillage, nearly the whole of it being valuable for grazing purposes. In this part of the State a considerable agricultural and pastoral population might subsist, and even grow rich, independent of its mineral wealth or of mining pursuits.

But it is in the final completion of

THE CENTRAL PACIFIC RAILROAD

That Nevada has received, not only her greatest immediate benefits the past year, but the best guarantee of her future prosperity and progress. Without contributing a dollar toward the accomplishment of that event—having even been enriched by the simple act of its construction, and the immense amount of taxable property it has brought within her borders—this State is now reaping the still more direct advantages accruing from this great thoroughfare, striking centrally across it, putting it in cheap communication with both the East and the West. Already these increased facilities for intercourse with the outside world are telling favorably on her great leading industry, multitudes of capitalists, merchants, manufacturers, statesmen, or others conspicuous in public affairs and the various walks of life, have visited this State, acquiring, during a few weeks spent in personal inspection, more satisfactory knowledge of its resources and opportunities for investment than could possibly have been obtained through information by others. Great gains have also been made to Nevada through the building of this road, by means of the reduction effected in the cost of transportation and travel, which has already been equivalent to sixty or seventy per cent.; and must hereafter result in the annual saving of millions of dollars to her citizens and others interested in the State.

How much this road has done toward increasing the population and developing the resources of Central and Eastern Nevada, will appear from the fact that, while the cost of traveling from San Francisco to that region prior to its construction, was from $80 to $100, it is now less than $50; the time required to effect the journey having been reduced from six to less than two days; the traveler, now protected from heat, cold, mud and dust, and having been enabled to refresh himself with food at proper intervals, and with regular sleep, arriving at the end of his journey in good condition for business; whereas, before, in all these particulars the opposite was the case, much suffering being experienced from heat and dust at one season, and from mud and cold at another, a day or two being required to recuperate after making the journey. The difference in the cost of freight upon an ordinary quartz mill, carried from Sacramento to that section of country by railroad or wagon, would vary from fifteen to twenty thousand dollars, being equivalent to one-fifth its entire cost, including erection. To transport a ton from Elko to Sacramento by wagon would consume three weeks, and cost at least $150. By railroad it is brought through in a little more than one day, and at a cost of $16. Adjacent to the railroad, and more especially in the Humboldt region, are vast quantities of ores, which, owing to their intractable nature or a scarcity of wood and water in the neighborhood, cannot be advantageously worked where they are, but which can, through the aid of the railroad, be shipped to points where they can be reduced with profit. Without this cheapened means of transportation, these ores would be worthless, not being sufficiently

rich to pay for team-carriage over the deserts. Already a traffic has commenced in the shipment of these ores, which must ultimately, and perhaps very soon, swell to enormous dimensions.

So, too, the lessened cost of transporting to tide-water the silver-bearing pigs of lead and copper must greatly stimulate the incipient, and, prospectively, large business of smelting ores in northern and eastern Nevada. Without railroad facilities the reduction of these smelting ores, even where favorably situated, could hardly be made remunerative, as the profit margin would be mostly covered by cost of transportation to market. Already the advantages inuring from the railroad have imparted to several of the mining districts in the Humboldt country new life; the accruing benefits having been two-fold—first, in reducing the cost of exporting ores, and, secondly, that of bringing in supplies; the latter having been, in former times, an onerous burden, owing to the desert character of the country over which they had to be transported. Stimulated by these lower rates, business in this region has greatly revived. All the old mills, some of which had done but little before, are now running with profit, as well also as several others recently put up. A number of mines upon which work had long been suspended are again yielding ore; neglected claims are once more being looked after, and a glimmer of confidence is flickering over this discarded and almost forsaken district. With such improvements, thus early effected in one of the oldest mining localities of the State, it is easy to foresee the influence the railroad must have upon those more recently settled and further removed from the main points of supply. In fact, it is this that is to secure to Nevada immediate and important advantages as a mining country, over every other State and Territory west of the Rocky Mountains. Running centrally across the State with lateral valleys at short intervals along its route, stretching away hundreds of miles between metalliferous ranges of mountains, this great thoroughfare, in conjunction with these natural channels of approach, opens up and renders the entire country most easy of access. With the facilities and comforts afforded by this road, a journey into Nevada from either the Pacific or Atlantic seaboard, is one which none need dread, being attended with the least possible hardship or danger.

THE WASHOE MINES.

Under this head are generally included the several mining districts lying near the western border of the State, with the Comstock lode carrying the only largely productive body of ore in that entire section of country, there being a number of small mines lying near it, which for several years past have been worked, some of them yielding fair returns. In this category we have the Occidental mine and the Lady Bryan mine, three miles east of the Comstock; the Daney, six miles south; and several mines along Gold Cañon. Recently operations have been resumed on a number of claims in the vicinity of the great master vein of the country, as well also as upon others in adjacent districts, where extensive exploratory work had formerly been carried on, having been suspended, in some instances, for six or eight years. It is now believed, with the present lessened cost of all the elements of production, that many of these abandoned claims, carrying often considerable quantities of low grade ores, can be mined with profit. Should this prove to be the case, on more thorough and extended trials, the area of the Washoe mining field must soon undergo a marked enlargement.

For various reasons—the most of them already stated—there has been much interruption of operations upon the Comstock lode the past year, leading to a diminution of the total annual product of bullion from the several claims along it, equivalent to at least thirty per cent., as compared with the average yield of former years. The causes of this reduction having operated with greater force in the earlier part of the year, the mines have, for some months past, been producing with greater freedom and steadiness than before. Several of the leading companies, who, twelve months ago, had, in consequence of the failure of millable ores in their lower levels, been compelled to have recourse to their low grade ores, near the surface, have since, on extending their explorations, come upon good, and, in some cases, large bodies of ore in both vertical and lateral directions. With the more full supply of fair grade ore thus afforded, the most of the mills in the district have been kept running, the prospect now being that they will not soon be compelled to again stand idle for want of ore. These recent developments are in accordance with the opinion expressed by Commissioner Raymond, who, upon inspecting the Comstock lode, over one year ago, remarked that the irregularities and alternations which had previously characterized that vein might be expected to recur on a scale proportionate to its magnitude, and that the barren zone, which most of the companies had then reached, however, it might prove of considerable extent, was no indication that the ore bodies would not reappear at greater depths. In this connection, it may be stated that since the issuing of our last Annual Mining Review, the preliminary report of Commissioner Raymond on the mines of the West has been published, and although hastily gotten up, and with very little aid, it is an able and valuable document, the chapter on the Comstock lode being especially interesting and useful for the lucid exposition given of its geological structure and extent of development, and the practical suggestions given as to the methods best adapted to its further exploration. A more extended report of the Commissioner, embracing the results of his last year's labors, has just been submitted to Congress, and may soon be expected to make its appearance. As it is supposed to cover a larger portion of the mining field on the Pacific slope than was before treated of, the publication of this report is awaited with interest.

In further remarking upon the future prospects of the Comstock lode, Commissioner Raymond observes that, while it undoubtedly carries its rich ores to great depths, the time must soon arrive when it can no longer be worked with remunerative results without a deep drain-tunnel, or at least a more extended combination of interests, looking to a more perfect and systematic method of exploration, as well as a more economical administration generally. Through the commencement of the Sutro Tunnel, and the completion of the Virginia and Carson Railroad—events of recent date—both these vital objects seem likely to be at least partially effected. The first of these enterprises, instituted some two months since, is being prosecuted with vigor, the advanced work having reached a length of nearly five hundred feet, with the main tunnel following rapidly after. It is now said that sufficient means are at command to keep the work in progress—at least for the present—with every prospect of enough funds being obtained to carry it to final completion. The construction of the railroad cannot fail to prove of immense benefit to the owners of these mines, in enabling them to ship their ores cheaply to points more favorable for reduction, and to bring to the mines material for timbering them, and fuel for the mills already built in the vicinity, at much cheaper rates than before. Already this road has reduced the cost of fuel at Virginia City $4 on a cord and lumber $6 per thousand feet, with the promise, on the part of the company, that still greater reductions shall be effected next spring, when, also, greatly increased quantities of low-grade ore will pass over the road to the mills. The annual saving to the various mining companies thus effected, it is expected, will range from $5,000 to $40,000 each, according to the capacity of their respective mills and mines—the aggregate saving being fully half a million dollars. If we estimate that 400,000 tons of ore have been milled the past year from the Comstock mines, and that it has yielded, on an average, $20 per ton, giving a total yearly production for the entire lode of $8,000,000, we shall not probably be far from actual results. While a good deal of this ore has been taken from reserves, in the shape of bodies, formerly left, as being too poor to pay for reduction, the greater portion has, no doubt, been extracted from levels varying in depth from 800 to 1,200 feet beneath the surface. The lowest workings attained are—on the Bullion grounds, 1,000 feet down, and thus far, without having reached any considerable bodies of pay ore. Taken altogether, the prospects of the Comstock lode may be regarded as favorable; since, if not yielding as formerly, it certainly presents a more promising aspect than it did one year ago. Indeed, there is much to warrant the belief that, with the experience now gained in mining, and the greater economy with which all its operations can now be carried on, that the owners of mines upon this lode will be likely hereafter to realize as large aggregate profits as ever before.

In proceeding to further examine the mines of this State, we are led to notice—taking them in the order of their location and development—

ESMERALDA DISTRICT,

n which, with the exception of one or two localities, but little has been done the past year. But a single mill, in the vicinity of Aurora—where some six or eight of large capacity have been erected—has been kept steadily running throughout the year, though one or two others have occasionally done a little work. The product of bullion, however, has been slightly increased over that of the preceding year, some trifling improvement being noticeable in the mining prospects of the place generally. The only really active mining camps have been Pine Grove and Silver Peak, in both of which a prosperous milling business has been done. The mines at Silver Peak, consisting of both gold and silver bearing lodes, belong, nearly all, to the New York Company, who have a large mill, now operating for over a year constantly and successfully on the ores. The company are now working their gold-bearing veins on Red Mountain, permitting their argentiferous lodes—many of which are of great volume, and fertile in high grade ores—to remain idle for the present. The property of this company here is one of great and increasing value. In the Pine Grove district, the prevailing ore, in which is also gold-bearing, some four or five mills are running with the most gratifying results, the metal being free, and easily saved, and the mines yielding it in large quantities. The lodes here are of masterly proportions, well formed, and seemingly permanent, many of them being over twenty feet thick, and carrying ore that mills $40 per ton. Much of the ore goes as high in the mill as $50, and large quantities over $20, the average of all worked being fully $30 per ton. The shipments of bullion have been large from Pine Grove the past year, and promise to be kept up for the future. They could be largely increased by an addition of milling capacity, for which there is every inducement and facility. Some recent sales of mines in this district are reported at prices quite surprising to outsiders. Gerrard's smelting works, near Pine Grove, have for some time been in successful operation, reducing the ores from a rich copper mine at that point at the rate of seven or eight tons per day, obtaining therefrom about twenty per cent. of copper and six dollars worth of silver to the ton. The ledge has been opened to a depth of one hundred feet, having at that point an average width of six feet. Recurring to the subject of

THE HUMBOLDT MINES,

we observe, by way of further detail, that the mill of John C. Fall and that of Stewart & Co., at Unionville, have for several months past been shipping a total monthly product of $50,000. The most of this is bullion, a portion ore—all from the Arizona lode—the better class of ore sent away goes to England for reduction. It assays at the rate of about $800 per ton—a second class assaying about $400. As both companies are hoisting more ore than they can reduce, an increase of milling capacity will soon be made. Other mills in this section of country are now running with success, and a good deal of work is again being done on the mines in the various districts, and, generally, with excellent prospects of success. Many of the lodes here carry much free gold, as well as ores rich in silver. The smelting works at Oreana, for a time idle, are again in operation, and promise to be kept steadily and profitably engaged for the future.

REESE RIVER AND SURROUNDING DISTRICTS.

As several mines in the vicinity of Austin have been yielding considerable quantities of high grade ore the past year, all of which has been reduced by the mills near the town—the most of it by the Manhattan mill—the shipments of bullion from that point have been liberal, amounting perhaps to a million dollars—a large share of it being the product of mines in the adjacent districts. Thus a great deal of extremely rich ore from the Cortez mines has come to the Austin mills for reduction, also some from districts further east, and others in the direction of White Pine. The bulk of this bullion, however, has been extracted from ores taken out of mines on Lander Hill, in close proximity to the town—a number of the ledges there, though still continuing narrow, having turned out more, as well as better, ore than near the surface, causing them to be held in much better estimation than formerly. The water which had been suffered to accumulate in the Murphy mine, at Twin river, Lander county, has lately been pumped out, preparatory to a general resumption of operations at that point, where a large and expensive mill, after running successfully for some time, was mysteriously suspended some two years ago, to the wonder of the public and the detriment of the stockholders. It is the unanimous opinion of those best capable of judging, that there existed no good cause for the stoppage of the mine and the mill, and that it was done in the interest of parties desirous of forcing down the stock of the company, in order to its more complete monopoly, the ostensible reason assumed being a loss of the pay streak, by a dislocation of the lode. That such a faulting did occur is true, but that no persistent efforts were made to recover the vein is equally certain. At Belmont, Nye county, after a year or more of general suspension of operations, both in the mills and mines, work is about being resumed with better chances of being continued than ever before, as many of the claims, under further development, are exhibiting valuable bodies of ore. The White Pine excitement carried away most of the population from this district, at a time when affairs there, after a season of depression, were about taking a favorable turn. Under better auspices, the district is likely to realize some of the high expectations entertained of it at first, as is the case with many others in that section of country.

Oregon.

While every passing year demonstrates more fully the great mineral wealth of this State, the annual product of her mines has gradually decreased for some time past; the principal cause of this falling off being, as is well understood, an insufficiency of water for working the placers, and of capital for the development of the vein mines that are known to exist. While the product of the precious metals was less there than for any year since mining was actively engaged in, there is every reason for believing that the product of the incoming year will show a marked increase, owing to the construction of water ditches, cheapened labor and a more abundant supply of capital. While the auriferous belt of California enters Oregon more centrally, and the silver region of Idaho and Nevada skirts its eastern border, the extension of the Coast range of this State carries into it coal, iron and copper—the coal and iron found there being superior to that met with in this range further south. Designating the gold fields of Oregon by the names of the several ranges and groups of mountains along or adjacent to which they are located, we have the Coast range, the Cascade, the Blue Mountain, the Snow and Puebla group in the south-eastern, and the Siskiyou, Umpqua and Calapooya ranges in the south-western part of the State. The mines in the Coast range district consist mostly of beach diggings, once very rich and still very extensive—reaching, at intervals, for nearly two hundred miles along the sea-coast—and having a record dating back fourteen or fifteen years. The earnings, which now range from three dollars to six dollars per day to the hand, were formerly much larger, many rich deposits having been found and worked out, which were beyond the reach of the waves when agitated by any but the fiercest storms. The Cascade gold district lies along the westerly slope of the Cascade mountains, striking north and south, centrally through Oregon. While gold has been found on the the bars along the Clackamas, the Molalla, the Santiam, the Calapooya, and in all the forks of the Williamette, only upon the Santiam have any elaborate efforts been made at working; these having been mostly confined to vein-mining, and resulted, thus far, in such poor success that the entire district has been finally abandoned. A few years ago good hopes were entertained of the Santiam mines, and but a year or two since a great deal of work was still being done there. But it now appears, after a liberal expenditure of money and a fair trial, during which buildings were put up, a costly road built, and a quartz and a sawmill constructed, that the quartz of that district is too poor to pay for working. In the Blue Mountain district the principal mining localities have been upon the John Day, the Crooked and the Burnt rivers, and along Current and Willow creeks. Some six or eight years ago numerous gold, silver and copper-bearing lodes—some of them of great apparent richness and power—were found in the Snow and Puebla mountain district, at which time a considerable population was drawn into the country, and some work done upon the mines. Owing to subsequent Indian difficulties, however, the remoteness of the locality and other obstacles, the country was afterward nearly abandoned, and not until within the past year have any further attempts been made toward a resumption of operations there. Recently, parties owning interests in that district having returned, a quantity of ore has been extracted from the mines and shipped to San Francisco and elsewhere for reduction; and it is now probable that these mines, which lie partly in Oregon and partly in the State of Nevada, will be worked more extensively and profitably; the construction of the Central Pacific Railroad having greatly reduced the distance the ore had before to be transported on wagons. The gold field ranging across the Siskiyou, Umpqua and Calapooya mountains—a series running transversely from the Cascade chain to the sea—after liberally rewarding a large population for ten or twelve years, has become so far exhausted as to have been mostly given up to Chinamen, a considerable number of whom manage to still earn what, to them, are satisfactory wages. With the decadence of the placers in this district, the whites have more generally turned their attention to quartz mining, which in due time is likely to become a prosperous industry, the lodes being large and numerous, and there being many facilities here for the reduction of ores. While lack of water has prevented a very high general success, many miners in the Blue Mountain country have done well. The Chinese, working claims considered worthless, have put a good deal of money into circulation, and in the Burnt river district, some companies after a monthly run, have cleaned up from ten to thirty thousand dollars. Covered by the Burnt river, Willow creek, Shasta, and other districts in eastern Oregon, is a broad scope of good placer mines, capable of affording profitable employment for a large number of men, could water be supplied for working them. Several years since a ditch was commenced for bringing water into this locality. Owing to the cost of labor, however, this work was suspended, after forty-five miles of it had been constructed. During the past summer, through the employment of Chinese labor, the contractor was enabled to resume operations on this ditch, carrying it forward twenty-three miles further, and insuring its final completion at an early day. As this will afford an abundant supply of water, the miners of that section look forward to the commencement of a long season of prosperity with the opening of spring. On Cañon creek, where the miners seem to have been less pinched for water than elsewhere, their earnings have been somewhat better than the average. The construction of a bed-room flume along this creek—now talked of—would, by giving an outlet for many valuable claims, at present unworked, afford remunerative employment to some hundreds of men. Notwithstanding a good deal of disappointment in regard to rumored discoveries and expected results in several new localities in this State the past year, it has been one of much activity among prospectors, the fruits of whose labors have been generally satisfactory and undeniably favorable to the mineral prospects of the country. Among other men of large scientific attainments, as well as long practical experience, Prof. John A. Veatch is now in the field, making examinations and reporting on some of the more promising districts in Oregon; wherefore we may look for some interesting facts relative to the geology and mineral wealth of that extensive and comparatively little explored country. While the Santiam mines have, as above stated, proved an entire failure, we are compelled to add that a further examination of the rumored discoveries of placer diggings on Lewis river and Moose creek, prove them to have rested on no better foundation. These localities are now quite deserted, the miners who visited them during the summer having been unable to make even moderate wages. We have, however, well verified reports of the finding of additional placers in various parts of the State, some of which, though not extensive, have liberally rewarded all who have been able to obtain claims for working. Lately very promising prospects of surface mines have been met with along Mountain creek, ten miles from the Dalles, while at Rye Valley, in the south eastern part of the State, recent and important discoveries of argentiferous quartz are reported, some of the assays obtained being very encouraging, and many of the lodes prospecting well in the croppings.

BUSINESS AND PERSONAL.

[*Short notices in this column fifty cents per line each insertion.*]

IRON AND STEEL MANUFACTURE.—CLAIM OF PATENT No. 97,897 in the manufacture of Iron and Steel, subjecting the mass of molten metal to the action of hydrogen gas alone, forced up through the mass in combination with a current or currents of atmospheric air or oxygen, introduced over the molten metal within a chamber of reflecting character, producing combustion of the carburretted hydrogen, phosphuretted hydrogen, &c., above the metal snbstantially as and for the purpose specified. WILLIAM ENNIS, Patentee and owner of this process, wishes to call the attention of manufacturers to the above claim. WILLIAM ENNIS,
jan11-1m Thirty-ninth street, north of Bridge street, Philadelphia.

GLYNN'S ANTI-INCRUSTATION FOR STEAM BOILERS.—The only reliable article for removing and preventing incrustation No foaming and does not attack metals of boilers. Liberal terms to agents. C. D. FREDRICKS,
Dec. 21, tf 587 Broadway, New York.

MARKET REVIEW.

The Coal Trade.

NEW YORK, Feb. 11th, 1870.

The state of the market this week confirms our prediction that coal has nearly "touched bottom." There are no changes in the rates of tolls, and the next movement in prices must be an upward one. The last "cold snap" has made the retail trade more lively, and some dealers have been putting in small stocks to meet the demand. This, in its way, must have an influence upon the wholesale market. Reports from the mines show that there is a growing uneasiness among the miners, which will very likely result in a general strike among them unless prices should advance. We renew our advice to consumers to lay in their stocks now, as it is almost impossible for coal to be lower. In our last we gave the figures and facts for this opinion.

Delaware and Hudson Canal Company have issued the following circular which speaks for itself. We give it in full:

DELAWARE AND HUDSON CANAL COMPANY,
General Office, No. 7 Nassau street,
(Continental Bank Building,)

NEW YORK, February 10, 1870.

The plan of selling the coal produced by this Company, at prices to be fixed month by month during the season, has been found to work so entirely to the satisfaction of all concerned, and is in itself so obviously just and fair, that the Company has decided to follow it in disposing of its product for the current year.

The course of procedure will be as follows, viz.:

1. Orders will be received at this office for Grate, Egg, Stove and Chestnut sizes Lackawanna Coal, to be delivered at Rondout, during the season of canal navigation—April 10th to December 10th—or during any portion thereof, upon the usual conditions of sale and shipment as hereunto annexed.

2. Such orders will be registered upon the books of the Company, in regular turn as they are received, until the 10th of March next, when the books will be closed, and as soon thereafter as practicable, parties will be notified of the quantities for which their respective orders have been accepted.

3. The coal will be deliverable at Rondout during the time agreed upon, at prices to be fixed by the Company, and announced by circulars issued on the first day of each month, for coal deliverable from the 10th of that to the 10th of the following month.

4. Purchasers finding the prices satisfactory, will be expected to notify the Company on or before the Fifth of the month, of their intention to take the Coal allotted them for that particular month. A failure to receive such notice by that date will be considered by the Company as evidence that the prices are not acceptable to the purchaser, and that the coal is declined.

5. Purchasers finding the prices fixed for any one month to be unsatisfactory, may decline taking their quota for that month, without prejudice to any of their rights respecting the proportions falling due in later months.

Orders for shipment by the Company's boats, to points on the Hudson River, when accepted by the Company's agent at Rondout, will be filled in turn with other orders received at the same time, but not to an extent exceeding the quota due the purchaser for the month in question, unless perfectly in accordance with the Company's convenience.

Those who have used Lackawanna coal, do not need to be informed of its superiority as a fuel for steam and domestic purposes. It is only necessary to say that in the future, as in the past, every effort will be made, and no expense spared, to maintain that superiority.

Attention is specially directed to the conditions for the sale and shipment of Lackawanna Coal, hereunto annexed.

CONDITIONS FOR THE SALE AND SHIPMENT OF LACKAWANNA COAL.

1. Every contract for the delivery of coal must stand upon its own merits, as regards prices, terms, etc.

2. The coal is designated by the names known in the Company's business; these names are used in selling or quoting prices; and parties are particularly requested to make use of the same in giving their orders for coal.

3. Captains of vessels going to Rondout for cargoes must carry with them an order from one of the Company's officers in New York, or from a purchaser who has made previous arrangements with the Company for the delivery of coal.

4. Captains are required to report their vessels at the Company's office at Rondout on their arrival, and take the berths assigned them by the Dock Master, in accordance with which they will take their regular turn in loading. Exertions will be made to give them prompt dispatch; but the Company will not be liable for demurrage, nor for any consequences attending unavoidable delay.

5. Bills of Lading, or other regular testimony of shipment, to be the proof of delivery, both as regards time and quantity.

6. Coal shipped on board of vessels other than the Company's barges, to be at the risk of the purchaser.

7. Every effort will be made by the Company for the fulfilment of its contracts in the delivery of coal; but if at any time the operations or business of the Company at the mines, or on its railroad or canal, should be interrupted by floods, breaks, accidents, combinations, turnouts, strikes among miners, boatmen, or other employees, or by casualties of any kind, the obligations of the Company to deliver coal under its contracts or agreements may, at its option, be canceled to the extent of the average daily quantity the purchasers would be entitled to receive under their contracts or agreements during the period of such interruption; and no liability shall accrue to the Company for damages by reason of such non-delivery, or for demurrage of vessels or otherwise.

8. The Company, when requested by purchasers, will use exertions to procure vessels for the transportation of coal, and to effecting insurance thereon, but will not assume any responsibility in relation thereto.

9. The purchaser will have no right to claim in any one month, more than a rateable proportion of the whole quantity of coal engaged. Should it be consistent, however, with the Company's convenience to deliver in excess of the proportion due in any one month, such excess will be charged at the prices of the current month, and must be accepted by the purchaser as on account of coal falling due in the next following month in which the purchaser signifies his desire or intention to accept his quota, at the prices fixed by the Company.

10. Any failure on the part of purchasers to send for their coal in the month when it is due, shall work an absolute forfeiture of their right to claim at any subsequent period the portion not called for in such month. When the quota engaged for any one month exceeds three hundred tons, the purchaser will be expected to take it away, as nearly as may be in regular weekly proportions.

JAMES C. HAITT,
General Sales Agent.

In our opinion, this is the most reasonable way of disposing of coal, both for Company and purchasers, as it has no depressing effect upon the market, and allows trade to take its regular course. Our readers will remember that a similar system was adopted last year by the Pennsylvania Coal Company, which is also to be continued this year.

We understand that there is an effort being made among our leading coal dealers to organize a general Coal Exchange. We have heretofore expressed our entire approval in regard to an organization of this kind, and pointed out the necessity of the thing. A thousand and one questions almost daily arise relative to demurrages, drawbacks, freights, refused cargoes, charters, towages, and insurances, which every dealer undertakes to settle on his own account, and consequently a great many differences constantly occur. A Coal Exchange, with a proper arbitration Committee, before whom all these differences could be brought, and their decision considered final, would indeed be a blessing, save an immense amount of money and time, which in the end would give the consumer his coal at a lower figure. Prices would also be arranged early in the day, which would positively rule for that day to a certainty, and the irregular and unreliable quotations given now would be done away with. We have our Produce Exchange, Real Estate Exchange, and in fact every important branch of industry has an Exchange of some kind to regulate its affairs except the coal trade, and we verily believe that there is no other branch of business that actually needs it as much. Give us a General Coal Exchange by all means, gentlemen.

FREIGHTS remain unchanged, though vessels are scarce and in good demand.

The proposed consolidation of several of the most important Bituminous Coal Companies is exciting considerable remark. The proposed consolidation is between the Maryland Coal Company and the Central Coal Company, the new Company to have a capital of some $20,000,000. As the total amount at which these Companies give in to the consolidation is $11,875,000, it leaves a large margin for the absorption of other Companies. The new Company will have under its control more boats and transportation facilities than any other Company in the Cumberland region, and at the same time comes into possession of the Cumberland and Pennsylvania Railroad. It is thought that under one general head they will be able to afford better facilities for trade and give more advantages than they could while underselling each other.

We note the Philadelphia market very quiet, very few orders coming in. The trade are hoping for a fair trade, on account of the late cold and stormy weather, which will stimulate the demand to some extent.

ITEMS.

The Lehigh Valley Railroad Company is sinking a shaft on its property below the Lackawanna.

A large breaker is nearly completed on the line of the L. & S. Road, east of the Lackawanna.

Mineral Spring mines are idle and will remain so till the trade revives.

The mines at Hazleton, Jeddo, and Eckley, are only working half time.—*Record of the Times*, Feb. 9, Wilkesbarre, Pa.

The Lehigh Company have a number of men at work repairing the canal banks on the river side opposite the Mansion House, which was badly damaged at the time of the freshet.

The coal breaker on the property worked last by Winlack, Murray & Co., at Ashland, was destroyed by fire on Wednesday evening, January 19. Report has it that this colliery had been abandoned and the breaker watchman discharged about ten days before the fire occurred. The slope connected with this colliery caved in about two weeks previous, shutting up the gangway between the bottom of the slope and the stables where mules were kept, in consequence of which thirteen mules were starved to death.

We understand that lately some Philadelphia parties leased a tract of coal land from Messrs. Coxe, Brothers & Co., west of Woodside, and sunk a shaft. They found a vein of excellent coal, and were about to commence operations, when, we are told, the Upper Lehigh Coal Company bought the lease, and it is expected they will build a breaker in the Spring. Another party have selected a site near the above, and are making arrangements to sink a shaft.

We learn from Superintendent Mallery that the Fall Creek Company have made preparations for mining twenty thousand tons of coal per month during the coming season.

The Short Mountain Company have not shipped any coal this year so far, the mines having been troubled with water.

No further conference has taken place between the operators and miners with regard to the basis for 1870.—*Pottsville Miner's Journal.*

Anthracite Coal Trade for 1869 and 1870.

The following table exhibits the quantity of Anthracite Coal passing over the following routes of transportation for the week ending February 5, 1870, compared with week ending February 6, 1869.

COMPANIES.	1869. WEEK.	1869. TOTAL.	1870. WEEK.	1870. TOTAL.
*Phila. & Reading R.R.	25,985	347,323	28,431	385,277
†Schuylkill Canal				
Lehigh Valley R. R.	39,668	322,513	47,937	489,245
Lehigh and Sus. R. R.	15,507	94,178	19,108	160,011
*Lehigh Canal				
Scranton North	8,923	48,721	14,369	63,211
" South	31,473	149,915	82,570	157,098
Penn. Coal Co., rail	17,538	82,661	19,047	91,927
†" " " canal				
Del. and Hudson, rail, N.			13,644	67,290
" " " south			4,356	13,113
Delaware & Hud. Can. N.				
" " S.				
Shamokin	7,515	36,126	5,614	26,231
Trevorton	485	2,642	187	1,668
Short Mountain	634	3,309		
Lykens Valley Coal Co.		3,155		
†Wyoming South				
†" North				
P. N. Y. C. & R. R. Co.			5,460	37,681
Williamstown, Col'y	1,760	5,400	1,277	14,089
Total	149,458	1,095,344	251,015	1,399,867
1870			149,458	1,095,344
Increase week and year				101,557	304,523

* Less coal transported for Company's use and Bituminous coal.
† Closed for the Season.

Bituminous Coal Trade, 1869 and 1870.

The following table exhibits the quantity of Bituminous Coal passing over the following routes of Transportation for the week ending Feb. 5, 1870, compared with week ending Feb. 6, 1869.

COMPANIES.	1869. Week.	1869. Year.	1870. Week.	1870. Year.
B. & O. R. R.				
C. & O. Canal				
H. & B. T. R. R.	6,292	30,977	4 976	15,570
Harrisburg & D.			3,486	13,174
L. V. R. R.		552		2,559
P. & N.Y. C. & R. Co.			3,083	31,389

Schuylkill Coal Trade.

Report of Coal transported via the P. and R. R. for the week ending Jan. 27, 1870—less coal carried for Company's use, and Bituminous Coal:

For week	38,431 05
Previously this year	349,816 05
Total	388,277 10
Same time last year	347,323 00
Decrease	40,954 10
Amount sent same week 1869	25,985 00

Report of coal transported on the Philadelphia and Reading Railroad for the week ending Thursday, February 3, 1870:

From St. Clair	28,050 16
" Port Carbon	4,0 8 01
" Pottsville	338 00
" Schuylkill Haven	1,6.6 14
" Auburn	933 10
" Port Clinton	3,992 03
" Allentown and Alburtis	22 01
" Harrisburgh and Dauphin	3,468 04
Total paying freight	41,493 09
Coal for Company's use	3,970 19
Total for week	45,470 08
To same time last year	422,971 13
Total	468,842 01
To same time last year	380,296 00

Penn. and N. Y. Canal and Railroad Co.

REPORT of Coal Transported via the Pennsylvania and New York Canal and Railroad Company, for week ending January 29, 1870:

	WEEK.	PREVIOUSLY.	TOTAL.
Anthracite	5 459 11	32,221 05	37,680 16
Bituminous	3,083 00	28,306 00	31,389 00
Total, Ant. and Bit.	8,542 11	60,527 05	69,069 16

Report of Coal Transported over Lehigh and Susquehanna Railroad.

Week ending February 5, 1870—Compared with same time last year.

WHERE SHIPPED FROM	WEEK, 1870. tons cwt	WEEK, 1869. tons cwt	YEAR, 1870. tons cwt.	YEAR, 1869. tons cwt
Wyoming Region	12383 05	6608 10	71042 08	57780 02
Upper Lehigh Region	690 13	3319 17	3248 12	16110 12
Hazleton Region	21 17	134 09	449 11	659 07
Mauch Chunk Region	2012 03	5564 13	25279 14	23628 07
Totals	18107 18	15507 09	100011 05	94178 08
Increase	2600 09		5832 17	
Decrease				
DISTRIBUTION.				
Forwarded East of Mch Chunk by Rail	17268 15	13765 01	96430 12	86778 09
Delivered at and above Mauch Chunk	834 04	530 00	3007 14	3384 00
Delivered to L. & B. R. R. at Plymouth Bridge	4 19	630 00	572 19	2660 10
L. V. R. R. at Sguar N.		551 17		1775 09
Totals	18107 18	15507 09	100011 05	94178 07
Of the above there was from Company's Mines.	5012 03	5364 13	28789 01	23628 07
Increase			5169 14	
Decrease	352 10			

Report of Coal Transported over Lehigh Valley Railroad

For the week ending February 5, 1870, and previously this season, compared with same time last year:

WHERE SHIPPED FROM.	WEEK. Tons. Cwt.	PREVI'S'Y. Tons. Cwt.	TOTAL. Tons. Cwt.
Total Wyoming	9,605 17	93,317 03	102,723 00
" Hazleton	27,150 06	216,693 13	243,843 19
" Upper Lehigh	5 14	56 19	62 13
" Beaver Meadow	6,418 12	81,312 07	87,730 19
" Mahanoy	4,907 05	49,571 03	54,478 12
" Mauch Chunk	43 15	362 02	405 17
Total Anthracite	47,931 13	441,313 07	489,245 00
Bituminous Coal recv'd from Cata. R. R.			
N. C. R. R.			
E. P. R. R.		2,559 00	2,559 00
P. & N.Y. C. & R.R. Co			
Fall Creek			
Schroeder			
Towanda			
Total by rail and canal	47,931 13	443,872 07	491,804 00
Same time last year	39,673 04	333,677 11	373,351 00
Increase	8,555 17	110,194 16	118,453 00
Decrease			
Forwarded East from M'h Chunk by rail	41,038 16	396,781 17	437,820 13
Same time last year	35,479 19	312,739 18	348,219 16
Increase	8,258 04	84,041 19	89,600 17

RECAPITULATION.

Forwarded East from M'h Chunk by rail	41,038 16	396,781 17	437,820 13
To N. C. R. R., at Mount Carmel		115 00	115 00
Forwarded North from L. & B. Junction	5,459 11	31,818 18	37,278 09
To L. & S. R. R. at Packerton for rail	71 11	832 00	903 11
Delivered at M'h Chunk	9 07	218 04	227 11
Delivered on line of road above Mauch Chunk	241 16	2,090 08	2,332 04
Delivered above M. Chunk for use of L. V. R.R.	1,110 12	8,801 11	9,912 03
To L. & S. R.R., at P'n Hav., for railroad			
Do. for canal		655 09	655 09
At M.Chunk for canal			
Total Anthracite	47,931 13	441,313 07	489,245 00
Bituminous Coal		2,559 00	2,559 00
Total all kinds	47,931 13	443,872 07	491,804 00

Delaware and Hudson Canal Company.

Coal mined and forwarded by the Delaware and Hudson Canal Company, for the week ending Saturday, February 5, 1870.

	WEEK.	SEASON.
North	45,350 18	208,082 14
South	4,376 02	13,112 18
Total	49,727 00	221,195 12
Corresponding time in 1869.		
North	32,802 13	180,629 10
South	1,578 07	5,775 06
Total	34,381 00	186,404 16
Increase North	12,548 05	Increase 27,453 04
Increase South	2,797 15	Increase 7,337 12
Total Increase	15,346 00	Increase 34,790 16

Cumberland Coal Trade.

B. & O. RAILROAD.

The shipments over the Baltimore & Ohio Railroad for the week ending Feb. 5, 1870, were as follows:

From Georges Creek via Piedmont.	Tons.
Consolidation Co	
Borden Co.	
Midlothian Co.	
Midland Co.	
From Eckhart R. R.	
C. C. & I. Co.	
Previously	
Total.,	4,634 15

Harrisburgh and Dauphin Coal Trade.

The following is the amount of Bituminous Coal transported via the P. and R. R. for the week ending Feb. 3, 1870:

	Tons.
For week	3,468 04
Previously this year	53,174 05
Total	56,642 09

Prices of Coal by the Cargo,

[CORRECTED WEEKLY.]

	AT NEW YORK, Feb. 11. R. A.	AT NEW YORK, Feb. 11. W. A.	AT PHILADELPHIA, Feb. 10. R. A.	AT PHILADELPHIA, Feb. 10. W. A.
SCHUYLKILL.				
Lump	$— —	$— —	— — 5 00	
Steamer	— —	— —	— — 5 00	
Broken	— —	— —	— — — —	
Egg	— —to— —	— —	— — 5 00	
Stove	— —to— —	— —	— — 5 25	
Chestnut	— —to— —	— —	— — 4 25	
Pea	— —	— —		— —
LEHIGH.				
Lump	5 75	— —	— —	— —
Broken	5 50	— —	— —	— —
Egg	5 50	— —	— —	— —
Stove	5 75	— —	— —	— —
Chestnut	5 00	— —	— —	— —
Pea	— —	— —	— —	— —
SPECIAL COALS.*				
Diamond Vein	R. A. 6 50		— —	— —
New England	"		— —	— —
Locust Dale	W. A. 6 00		— —	— —
Honey Brook, Le'h	W. A. 4 50 to 5 25		— —	— —
Spring Mount	" " 4 50 to 5 25		— —	— —
Sugar Creek	" " 4 50 to 5 25		— —	— —
Sugar Loaf	" " 4 50 to 5 25		— —	— —
Fulton	" " 4 50 to 5 25		— —	— —
Stout	" " 4 50 to 5 25		— —	— —
Old Comp'y's	" " 4 50 to 5 25		— —	— —
Cross Creek	" " 4 50 to 5 25		— —	— —
Enterprise	" "		— —	— —
Girardville	" "		— —	— —
McMichael	" "		— —	— —
Shamokin	" "		5 50	5 50	— —	— —
Lykens Valley	" "		— —	— —
Broad Top	" "		4 75	— —
Hill & Harris	" "		5 50	— —
Henry Clay	" "		5 50	— —
Powelton	" "		5 25	— —

Prices for Coal at Mauch Chunk.

	F.L.	Bro.	Gra.	Eg.	Sto.	Cat.
Lehigh	$3 00	$3 25	$3 25	$3 25	$3 75	$3 00
Wilkesbarre	3 00	3 25	3 25	3 25	3 75	3 00

For freight to Elizabethport and to New York see "Freights."

BITUMINOUS COALS.

Kittaning Coal Co.'s Phœnix Vein..f.o.b. at Phila.	$5 25
" Lemon " "	5 00
Cumberland C. & I. Co.'s on board	N. Y. 7 50
Central C. & M. Co.'s "	" 7 50
Consolidated Coal Co.'s "	" 7 50

(*Dealers in these coals may be found in our advertising columns.)

Company Coals.

	L.	Str.	Gra.	Eg.	Sto.	Ches.
Scranton at E. Port	— —	— —	— —	— —	— —	— —
Pittston at N. Y.	— —	— —	— —	— —	— —	— —
Lackawana at Weh'kn.	4 65	4 70	4 80	5 00	5 40	4 60
Wilk'b're at Hoboken	4 75	4 75	4 75	4 75	5 25	4 50
Old Co. Lehigh at Pt. Johnston	5 50	5 00	5 00	5 00	5 25	4 50
Lehigh at E. Port	5 25	5 00	5 00	5 00	5 25	4 50

For freights to different points, see "Freights."

Prices of Foreign Coals.

February, 1870.

Duty $1 25 per ton.

Corrected weekly by PARMELE BROS., No 32 Pine street, New York.

Liverpool Gas Caking	$ 9 50@— —
" " Cannel	13 00@14 00
" House "	14 50@17 50
" " Orrel	14 00@16 00

Per ton 2,240 lbs., ex-ship.

PRICES FROM YARD.

Liverpool House Orrel, screened	$16 00@18 00
" " Cannel, "	19 00@22 00

Per ton 2,000 lbs., delivered

Prices of Gas Coals.

February, 1870.

PROVINCIAL.

Corrected weekly by Louis J. Belloni, Jr., 43 Pine st., N. Y.

Duty, $1 25.

	Coarse. Gold.	Slack. Gold.
Block House	$1 75	@- 75
Gowrie	1 75	@- 75
Lingan	1 75	@- 75
Sydney	2 12½	@- 71½
Pictou	1 12½	@1 18¾
Little Glace Bay	1 50	@1 00
Caledonia	1 50	@- 75

AMERICAN.

	Coarse. Currency.	Slack. Currency.
Westmoreland Co.	— —	@- —
Despard Coal Co.	$8 50	@8 00
Penn.	— —	@- —
Newburg Orrel Gas	8 50	@8 00
West Fairmount Gas Coal	— —	@8 00

AT PHILADELPHIA.

Powelton	$7 50

Prices at Baltimore—Feb. 1870.

Corrected Weekly by Edw. J. Stahler, Jr., Baltimore, Md.
Wholesale Prices to Trade.

Wilkesbarre, by cargo or car load	$6 40@6 65
Pittston and Plymouth	6 00@6 50
Shamokin Red or White Ash	6 00@6 25
Lykens Valley Red Ash	— —@6 50
Trevorton, Red Ash	6 00@6 50
By retail, per ton of 2240 lbs. delivered	7 75@8 75
Georges Creek & Cumberland f. o. b. at Locust Point for shipping	— —@5 00
West Fairmount Gas f. o. b.	— —@6 00

Prices at Georget'n, D.C., & Alexandria, Va.

February, 1870.

George's Creek and Cumberland f. o. b. for shipping..$4 75

Prices at Havre de Grace, Md.

Wilkesbarre and other White Ash for cargoes	$- —@- —
Lykens Valley	— —@— —
Shamokin Red or White Ash	— —@— —
Trevorton and Zebra Valley	— —@— —

Rates of Transportation to Tide Water.

BY RAILROAD.

TO PORT RICHMOND, PHILADELPHIA.

Philadelphia and Reading Railroad, from Schuylkill Haven	$2 00

From Port Carbon, 8 cents per ton more.

MAUCH CHUNK TO ELIZABETHPORT.

L. V. Railroad from Mauch Chunk to Easton	$ 81
C. R. R., N. J., Easton to Elizabethport	1 19
Shipping expenses at Elizabethport	25
Warfage	10
Total	$2 35

MAUCH CHUNK TO PORT JOHNSON.

L. V. R. R. or L. & S. R. R. from M. C. to Easton	$ 81
C. R. R., of N. J., Easton to Pt. Johnson	1 19
Shipping expenses	25
Warfage	10
Total	$2 35

TO HOBOKEN.

L. V. R. R., Mauch Chunk to Easton	$ 81
Morris & Essex R. R. Easton to Hoboken	1 19
Shipping expenses	25
Warfage	10
Total	$2 35

TO SOUTH AMBOY.

L. V. R. R.	81
B. & D. R. R.	1 28
Cam. & Am. R. R.	
Shipping Expenses,	25
Total	$2 34

PENN HAVEN TO ELIZABETHPORT.

L. V. RR. Penn Haven to Easton	95
C. RR. of N. J. Easton to Elizabethport	1 19
Shipping expenses	25
Wharfage	10
Total	$2 49

Freights.—FEBRUARY, 1870.

TO EASTERN PORTS.	From Tuscaloosa.	From E. Portsmouth Port Johnston	From Newburg	From Rosabel &c.
Stamford	$2 60	$1 10	@	@
Norwalk	2 25	1 00		
Bridgeport	2 00	1 00		
New Haven	2 25	1 00		
Hartford	2 75	1 50		
New London	2 00	1 25		
Norwich and Sou	2 00	1 40		
Mystic	2 00	1 40		
Stonington	2 00	1 40		
Sag Harbor	2 00	1 40		
Bristol	2 50	1 40		
Newport	2 50	1 40		
Fall River	2 50	1 40		
Providence	2 50	1 40		
Dighton	— —	— —		
Warren	— —	— —		
Pawtucket	2 25	— —		
New Bedford	2 25	1 40		
East Cambridge	3 00	2 10		
Salem	3 00	2 00		
Newburyport	3 10	2 00		
Portsmouth, N. H.	3 55	2 75		
Rockport	— —	— —		
Saco	3 00	2 25		
Portland	3 00	2 00		
Bangor	3 00	— —		
Bath	3 00	2 30		
Middletown	— —	1 50		
Amesbury	3 25	— —		
Boston	3 15	2 00		
Cambridgeport	3 00	2 00		
Taunton	3 10	2 00		
Derby	2 00	— —		
New York	1 75	50		
Hackensack	1 95	— —		
Jersey City	1 75	50		
TO RIVER PORTS.				
Troy	— —	— —		
Albany	— —	— —		
Cooyman's	— —	— —		
Stuyvesant	— —	— —		
Cocksackie	— —	— —		
Hudson	— —	— —		
Catskill	— —	— —		
Poughkeepsie	— —	— —		
Fishkill	— —	— —		
Cold Spring	— —	— —		
Haverstraw	— —	50		
Nyack	1 60	50		
Sing Sing	1 60	— —		
Yonkers	— —	40		
New York	— —	— —		
Saugerties	— —	— —		
Rhinebeck	— —	— —		
Rondout	— —	— —		
Tarrytown	1 60	80		
West Point	— —	— —		

Foreign and Provincial Freights.

February, 1870.

Foreign.	
Newcastle and Ports on Tyne	£15@£17 keel
Liverpool	15s. —. do
TO NEW YORK.	
Provincial	
Sidney	$3 25
Lingan	3 25
Cow Bay	3 25
Port Caledonia	3 25
Little Glace Bay	3 25
TO BOSTON.	
Sydney	$2 75
Lingan	3 75
Cow Bay	3 25
Port Caledonia	3 00
Little Glace Bay	2 25

METALS.

IRON.—Duty: Bars, 1 to 1½ cents ₱ lb; Railroad, 70 cents ₱ 100 lbs.; Boiler and Plate, 1½ cents ₱ lb; Sheet, Band, Hoop, and Scroll, 1½ to 1¾ cents ₱ lb; Pig, 9 ₱ ton; Polished Sheet, 3 cents ₱ lb.

Pig, Scotch No. 1, ₱ ton	32 00@34 00
Pig, American, No. 1	34 00@35 —
Pig, American, No. 2	31 —@34 —
Pig, American, Forge	30 —@31 —
Bar, Refined, English and American	— —@82 50
Bar, Swedes, assorted sizes (gold)	85 00@97 50
	Store Prices.
Bar, Swedes, ord'y sizes, less 5 ₱ ct	120 —@130 —
Bar, Refined " " "	82 50@ 85 —
Bar, Common " " "	— —@ 80 —
Scroll " " "	110 —@145 —
Ovals and half-round " " "	105 —@130 —
Band " " "	105 —@ — —
Horse Shoe " " "	105 —@ — —
Rods, ⅜ to 3-16 inch " " "	90 —@140 —
Hoop " " "	110 —@155 —
Nail rod, less 5 ₱ ct	— 8—@— 8½
Sheet, Russia, as to Nos. (gold)	— 11—@— 12—
Sheet, Single, D, and T. Common	— 5½@— 7
Sheet, Galvanized	List 25@30 ₱ cent. discount.
Rails, English (gold), ₱ ton	57 00 @— —
Rails, American, at Works in Pa	76 00 @77 00

STEEL.—Duty: Bars and ingots, valued at 7 cents ₱ lb or under, 2½ cents; over 7 cents and not above 11, 3 cents ₱ lb; over 11 cents, 2½ cents ₱ lb, and 10 ₱ cent ad val. (Store prices.)

English Cast (2d and 1st quality) ₱ lb	— 16	@— 20
English Spring (2d and 1st quality)	— 7	@— 13
English Blister (2d and 1st quality)	— 11	@— 18
English Machinery	— 11½	@— 14
English German (2d and 1st quality)	— 13	@— 15
American Blister "Black Diamond"	— —	@— 12
American, Cast, Tool do.	— 18	@— —
American, Spring, do.	— 9	@— 12
American Machinery, do.	— —	@— 12
American German, do.	— 10	@— 12

COPPER.—Duty: Pig, Bar, and Ingot, 5; old Copper 20 cents ₱ lb; Manufactured, 45 per cent. ad val.

	All Cash.
Copper, New Sheathing, ₱ lb	— @— 32
Copper Bolts	— @— 33
Copper Braziers, 16oz. and over	— @— 33
Copper Nails	38 @— —
Copper, Old Sheathing, &c., clean	18 @— 19
Copper, Chili Pig	— @— —
Copper, American Ingot	21 @— —
Yellow Metal, New Sheating	— @— 26
Yellow Metal Bolts	— @— 26
Yellow Metal Nails	— @— 22

LEAD.—Duty: Pig, $2 ₱ 100 lbs.; old Lead, 1½ cents ₱ lb; Pipe and Sheet, 2¾ cents ₱ lb.

Galena, ₱ 100 lbs	$— — @— —
Spanish (gold)	6 20 @6 30
German, do.	6 20 @6 50
English, do.	6 25 @6 62½
Bar (net)	— — @ 8 00
Pipe and Sheet (net)	— — @ 8 00

TIN.—Duty: Pig, Bars, and Blocks, 15 ₱ cent. ad val.; Plate and Sheets and Terne Plates, 25 ₱ cent. ad val.

	Gold ₱ lb.
Banca	32 @— —
Straits	30½@31
English	— @29½

PLATES.

Fair to Good Brands.	*Gold.*	*Currency.*
I. C. Charcoal, ₱ box	$8 00 @8 37½	$10 00 @10 50
I. C. Coke	6 75 @7 37½	8 50 @ 9 50
Coke Terne	— — @6 00	7 50 @ 8 00
Charcoal Terne	7 50 @8 00	9 25 @10 00

SPELTER.—Duty: In Pigs, Bars, and Plates, $1 50 ₱ 100 lb.

	Gold.
Plates, Foreign ₱ 100 lbs.	$5 87½@6 12½
Plates, Domestic ₱ lb.	10 @— 12

REMARKS.

IRON.—We have no marked change to notice in the market for either Scotch or American Pig. Dealers purchase sparingly, and as stocks are steadily increasing, prices are inclined to favor buyers. The sales are 68 tons Eglinton, and 500 do. No. 2 ex-Crane, on private terms. There has been active inquiry for new American Rails and some 10,000 tons have been taken at a private price. We quote English, $57 gold, and American, $76@77 currency, at the works in Pennsylvania. From store, business is at a stand, and prices, though recently reduced, are still nominal.

LEAD.—The market for Pig is still quite dull, the considerable stock weighing heavily upon it. We have only to notice the sale of 50 tons, Spanish, at $6 25 gold. Bar, Pipe, and Sheet, are steady at 8 cents, net cash.

TIN.—There is scarcely any demand for Pig, but the advices from the European markets are more favorable, prices of Straits having advanced in London since the 22d ult. from £109 to £115, and holders evince more confidence; 5 tons English sold at 29½ cents, and small lots Straits, 30½ @ 31, now generally held at 31; Banca, 32½, all gold. Since our last Plates have been quiet, and we have only to notice the sale of 500 bxs. M. F. Charcoal Tin at a private price. Holders are quite firm, pending the settlement of the tariff question.

COPPER.—New Sheathing is steady at 32 cents, and Yellow Metal 26, cash. Ingot remains dull, and the market has been rather in buyers' favor; sales have been made of several parcels, in all 300,000 lb. Detroit and Lake Superior, at 21 cents; and 55,000 lb. Tennessee, for export, at the same price.

STEEL.—All descriptions, both of domestic and foreign, are quiet at our quotations, which for "Black Diamond" (American) are slightly reduced for jobbing lots from store.

ZINC.—American, dry, 7½c.; French, dry, 11c.; Metallic, 10½c.

MANGANESE—5c. per lb.

Mining Stocks.

NEW YORK, Feb. 11, 1870.

Prices of many gold and silver stocks have advanced. Mariposa is a marked instance, being now quoted 9½ @ 10½ for common, and 20¼ @ 20½ for prefered. Sales are more abundant in Rocky Mountain at 5c.; Grass Valley at 24; Black Hawk at 25; Central at 15; Quartz Hill at 66; and Smith & Parmelee s. 3 at $1 85.

The following is the latest report of Petroleum stocks:

	Bid.	*Asked.*
Bennehoff	30	39
Bergen Coal and Oil	—	—
Bliven Oil	—	—
Brevoort	—	—
Buchanan Farm	36	43
Central	37	50
Clinton Oil	—	—
Home Petroleum	5 00	6 00
National	—	1 25
New York and Alleghany	1 50	—
Northern Light	55	—
Pithole Creek	1 50	1 75
Rathbone Oil	25	—
Rynd Farm	33	34
Second National	—	—
Phillips	—	—
United Petroleum Farms	19	—
United States	73	78

San Francisco Stock Market.

SAN FRANCISCO, February 7, 1870.

(By Telegraph.)

	1st Board.	*2d Board.*
Savage	57½	—
Crown Point	19½	—
Yellow Jacket	52¼	49½
Kentucky	1 00	98
Chollar Potosi	19⅛	19¼
Gould & Curry	no sales.	
"	4th	45
Ophir	13	13½
Alpha	12	—
Belcher	28½	—
Imperial	31	—
Hale & Norcross	1 48	1 61
Amador	no sales.	
"	4th	3 25

Colors from Petroleum—A Swindle.

PROF. C. F. CHANDLER was lately requested to give an opinion with regard to some samples of colors which a chemist (?) pretends to have made from petroleum residues, and in which he is seeking to interest capitalists. The specimens were very beautiful, but they resembled very closely the bronze powders which are extensively imported from Germany. Professor CHANDLER at once tested them for metals, and found that the brilliant red consisted of finely divided copper, the golden specimens of brass, and the silver white specimen chiefly tin. The colors are simply metallic powders, and cannot, of course, have been extracted from petroleum residues. This is a gross imposition, which any chemist would at once detect.

A Chance for Explorers.

THERE is a cave in Corydon, Indiana, the entrance of which is only three squares from the Court House, connected with which is a singular phenomenon. A continual current of cold air comes out of the entrance, which will keep a fan turning if it is suspended before the hole. During the recent hot weather, some gentleman placed a thermometer in the cave. In five minutes the mercury sank from nearly 108° to 58°. The cave has never been explored, consequently whence the current of air comes, or what causes it, remains unknown.—*Architectural Review.*

White Pine Bullion—Product in 1869.

THE *Inland Empire* figures out the amount of bullion produced in the White Pine mines during the past year at $2,089,000, to which half a million more should be added for ores worked elsewhere. In addition to this, $56,000 should be added for base-metal bullion, making a total of $2,658,000. So much for the first year.

MINING COMPANIES AND STOCK QUOTATIONS.

GOLD AND SILVER COMPANIES.	SITUATION OF MINE.	SECRETARY AND PLACE OF BUSINESS.	CAPITAL.	PAR VALUE.	OFF'R'D.	ASKED.
Alameda Silver		A. Queran, 108 Wall st	$2,000,000	$10 00		
Ada Elmore	South Boise, Idaho					
American Flag	Nevada District, Col	P. P. Fullerton, 71 B'way	600,000	10 00		
Atlantic and Pacific	Humboldt Co., Nevada					
Bates and Baxter	Colorado			50 00		
Benton	Colorado	W. F. Drake, 15 Broad	500,000	5 00		12
Briggs	Colorado	J. P. Davies, 19 Cliff	1,000,000	100 00		
Black Hawk	Colorado	C.T.Whittington, 48 Broad	2,500,000	100 00	20	40
Bobtail	Colorado	J. Stanton, Jr., 25 Nassau	1,000,000			
Bullion Consolid'ed Gold	Colorado					
Burroughs Gold	Colorado					
Central Union Gold					13	16
Consolidated Gregory	Colorado				1 85	2 00
Combination Silver	Nevada			100 00	1 50	
Columbia Silver	Austin, Nevada	J. M. Brown, 155 B'way	5 000,000			
Commercial Silver		J. E. Smith, 26 Pine	3,000,000			
Corydon	Gilpin Co., Colorado	J. Samuels, 40 B'way	500,000			
Downieville	Colorado		2,500,000	25 00		
Eagle Gold	Gold Dirt Dist., Col	J. P. Davies, 19 Cliff	300,000	1 00		
Empire Gold and Silver	BodicBluff,MoneCo.Cal	H. K. Gates, 70 B'way	1,000,000			
Edgehill		A. Fullerton, 71 B'way	10,000,000			
Esperanza Silver		Ezra Clark, Jr., 13 William	400,000			
Fisk Gold		H. Johnson 195 Fulton	500,000			
Forest Queen		E. B. Beet, 62 B'way	1,000,000			
Golconda Gold	Sherbrooke, C. E	H. Adams, 71 Broadway	2,000,000			
Gregory	Colorado		1,250,000			
Gunnell Gold	Colorado	J. H. Rolston, 80 B'way	1,000,000	50 00		
Gunnell Central	Colorado	C. B. Bostwick, 16 B'way	3,000,000	10 00		
Gold Rock		R. M. Lockwood, 93 Wall	400,000			
Grass Valley					22	25
International Silver		J. W. Brazier, 26 Pine	600,000			
Hope Gold	Colorado		5,000,000			
Holman			2,000,000	25 00		
Kipp & Buell	Colorado		300,000			
Knickerbocker Gold		J. H. Rolston, 80 B'way	200,000	100 00		
La Crosse Gold	Nevada Dist., Col	P. P. Fullerton, 71 B'way	1,000,000		12	
Lander Hill T. & S	Nevada	M.L.Catherwood,74 B'way	1,000,000			
Lewis Gold	Georgia		1,000,000			
Liberty Gold					2	3
Manhattan Silver	Nevada	M. L. Ogden	400,000			
Maraposa common	California	Jas. H. Ferdon, 34 Wall	12,000,000		9⅞	10⅛
Mariposa preferred	California	do. do.			20⅛	20⅝
Montana Gold		G. De Cordova	400,000			
Montana M. L. & M. Co	Montana	A. M. Hoyt, 22 William	250,000			
Montrose	Clear Creek Co., Cal	W. W. Perkins, 71 B'way	1,000,000			
New York Silver	Nevada	Thos. Sproull, 78 B'way	1,500,000			
New York and Austin	Nevada	E. R. Siccomb, 70 Wall	500,000			
New York and Owyhee	Owyhee Co., Idaho		1,000,000			
New York and Eldorado		G. H. Munroe, 10 Wall	2,000,000		12	
N. Y. & Montana M. & D.	Montana	F. A. Chapman, 20 Nassau	1,250,000			
N. Y. & Silver Peach	Nevada	R. C. Root, 74 B'way	2,000,000			
N. Y. & Utah P. & M		W. H. Mailler, 108 Wall				
Ophir Gold	Comstock Lode, Nev	L. C. Warner, 70 B'way	625,000			
Owyhee Gold		W. H. Smith, 43 Ex. Place	1,700,000			
Pahranagat Central	Nevada	J. E. Smith, 25 Pine	6,000,000			
Quartz Hill Gold		F. Bernard	2,500,000		72	74
Reese River Consol'd	Nevada	W. B. Ogden	6,000,000		65	70
Rocky Mountain	Colorado	S. M. Pond, 70 B'way	500,000	10 00	5	7
Rollins Gold		Thos. Bond, 132 B'way	600,000			
Sensenderfer	Colorado	H. A. Shewill, 19 Broad	1,000,000		1 00	
Silver Bend		F. W. Macy, 20 Nassau	1,500,000			
Silver Mt. Silver		H. A. Moen, 71 B'way	1,000,000			
Silver Peak & R. M	Nevada	W. B. Ogden, 52 Wall	5,000,000			
Smith & Parmelee	Colorado	W. H. Hollister, 6 Broad	2,500,000	20 00	1 85	1 95
Social & Steptoe Con		T. H. O'Connor, 24 Nassau	450,000			
Standard Gold		C. B. Bostwick, 169 B'way	500,000			
Symonds Forks					45	75
Twin River Silver	Nevada	J. F. R. Hadden, 20 Nassau	800,000	100 00		
Texas Gold	Colorado		500,000	10 00		
Union Gold	Colorado	F. A. Potts, 110 B'way	1,200,000			
Wash. Mill & Silver	Nevada	W. W. Perkins, 71 B'way	300,000			
Wauba Yuma	Arizona	J. W. Silsby, 36 Pine	6,000,000			

COAL AND IRON COMPANIES.	SITUATION OF MINE.	SECRETARY AND PLACE OF BUSINESS.	CAPITAL.	PAR VALUE.	OFF'R'D.	ASKED.
American Coal Co		M. A. Myers, 119 B'way	$1,500,000	$25 00		
Ashburton Coal Co		J. T. Rollins, 41 Pine	2,500,000			
Block House Coal		D. B. Keeler, Jr., 43 Pine	1,000,000			
Brewster Iron		H. Robison, 165 B'way	150,000			
Broad Top Coal & Iron Co	Pennsylvania	B. Love	2,000,000			
Cameron Coal Co		J. A. Simpson, 40 B'way	2,500,000			
Carbon Hill Coal Co		J. Silsby, 36 Pine	1,000,000			
Central Coal		F. P. White, 111 B'way	2,000,000	100 00		
Clifton Iron Co		P. H. Riordan, 34 Pine	1,250,000			
Columbia Iron		F. D. Webb, 77 Cedar	1,000,000			
Consolidation Coal	Maryland	J. S. Mackie, 71 B'way	5,000,000			
Crawford Coal		E. Clapp, Prest, 137 B'way	1,000,000			
Cumberland C. & I. Co		E. Kiscan, 90 B'way	5,000,000		34	34¼
Derby Coal Co		W. S. Davison, 11 Broad				
Dover Coal and Iron Co		L. Chase, 88 Wall				
Del. & Hudson Canal Co		R. H. Nerderpol, 7 Nassau	15,000,000	100 00	1 21	
Ebervale Coal		G.L.Stout, Treas.,111 Br'y	500,000			
Fall River Bituminous		D. T. Blauvelt, 43 Pine	1,000,000			
Farrar Coal		C. H. Jones, 43 Pine	250,000			
Fisher Iron Co		M. Ellis, 19 William	100,000			
Hamp're & Balt. Coal		S. M. Pond, 70 B'way	500,000			
Iron Cliffs Co		C. J. Canda, 52 Wall	1,000,000			
Jackson Iron		G. P. Loyd, 119 B'way	300,000			
Kemble Coal & I. Co		R. A. Wight, 26 Ex. Place	300,000			
Keokuk Coal		J. F. Franklin, 112 B'way	100,000			
Lackawanna I. & C	Pennsylvania	E. C. Lynde, 52 Wall	1,200,000			
Lewis Run C. & I. Co		C. A. Sanborn, 80 B'way	750,000			
Lykens Val. Coal Co		F. A. Platt, 13 William	800,000			
McKean Co. Bit. Coal Co		J. H. Rolston, 80 B'way	1,500,000			
Lehigh & Susquehanna		E. W. Cark, Philadelphia, Pa.			90	1 45
Mahanoy			400,000	100 00		
McNeal C. & I. Co		C. C. Godwin, 71 B'way	500,000			
Mount Riga Iron		G. M. Newton, 42 Cedar	300,000			
New Boston Coal		C. H. Ogden, 55 B'way	2,000,000			
N. Y. Con. C. & I. Co		A. T. Levine, 16 Wall				
N. Y. & Lehigh Coal		T. Simpson, 111 B'way	150,000			
Pacific Coal Co		G. Wrighton, 34 Wall				
Peekskill Iron Co		W. Murdock, 7 Nassau				
Pennsylvania Coal Co		E. H. Mead, 111 B'way	3,200,000	50 00		
Richmond Iron Co		C. H. Smith, 165 B'way	1,000,000			
Scotia Coal Co		W. N. Soper, 42 B'way	2,500,000			
Spring Mt. Coal		J. Runyon, 111 B'way	1,250,000			
Springfield & D'p Run C.		E. D. Webb, 77 Cedar	600,000			
Stout Coal Co		H. S. Comstock, 111 B'way	500,000			
Susquehanna & Wyoming		E. Potter, 40 B'way	1,000,000			
Tannerdale Coal		I. T. Ludlaw, 71 B'way	250,000			
Wash. Mutual Coal		M. C. Baker, 117 B'way	420,000			
West Point Iron Co		R. C. Brock, 110 B'way	500,000			
Wilkesbarre C. & I. Co		W. H. Tillinghast, 80 Br'y	3,400,000			
Wyoming Val. Coal Co		E. Potter, 40 B'way	1,000,000			

COPPER AND LEAD COMPANIES.	SITUATION OF MINE.	SECRETARY AND PLACE OF BUSINESS.	CAPITAL.	PAR VALUE.	OFF'R'D.	ASKED
Anita Copper	California	J. A. Ferguson, 8 Wall				
Corinth Copper	Corinth, Vermont	S. H. Howard, 191 B'way	$600,000	25 00		
Davidson Copper					3	25
Eagle Harbor Copper	Michigan	W. H. Smith, 43 Ex. Place	500,000	25 00		
Evergreen Bluff Copoer	Michigan	F. W. Caper, 44 Ex. Place	500,000	25 00		
Globe Copper		R. K. Rickard, 19 Nassau	200,000			
Grand Portage Copper Co		A. S. Kellogg, 22 Pine	500,000			
Guymard Lead		Samuel Vernor, 38 Pine				
Hilton Copper		W. H. Smith, 43 Ex. Place	500,000			7
Hope Copper		J. W. Davis, 19 Nassau	500,000			
Hudson River Copper	New York	T. Clarkson, 22 William	1,500,000			
Indiana Copper Co		J. M. Mills, 25 Nassau	500,000			
Isle Royale Copper	Michigan	F. W. Caper, 44 Ex. Place	1,000,000			
Keweenaw Copper	Michigan	F. W. Caper, 44 Ex. Place	500,000			
Lake Superi'r Silver Lead	Michigan	A. S. Kellogg, 22 Pine	1,000,000			
Omiga Copper	Michigan	S. Cooper, 7 Pine	500,000			
Ridge Copper	Michigan	J. L. Gardiner, Jr., 43 Ex. P	500,000			
Rockland Copper	Michigan	A. Fullerton, 71 B'way	500,000			
St. Joseph Lead	Michigan	J. W. Jones, 6 Broad st	1,000,000			
St. Marguret Copper		E. P. Sutton, 43 Pine	250,000			
Schoolcraft Copper		R. Walsh, 22 William	500,000			
Superior Copper	Michigan	A. Fullerton, 71 B'way	500,000			
Union Copper		A. S. Kellogg, 22 Pine	500,000			
Vermont Copper	Vermont	J. C. Fly, 191 B'way	500,000			
Wallkill Lead, asst		S. M. Pond, 70 B'way			4	5

MISCELLANEOUS.	SITUATION OF MINE.	SECRETARY AND PLACE OF BUSINESS.	CAPITAL.	PAR VALUE.	OFF'R'D.	ASKED.
American Zinc Co		W. E. Lawton, 19 Cliff	$1,000,000			
Bigelow Blue Stone Co		H. Bogardus, 14 Pine				
Quicksilver					13⅜	14
Covill B. L. M. & M'f. Co		C. R. Bostwick, 302 Pearl	250,000			
Manhattan Marble		H. K. Gates, 70 B'way	300,000			
N. Jersey Zinc Co	New Jersey	A. H. Farlin, 61 Maiden L'e	1,500,000			

American Institute Lectures.

THE COLORADO PLATEAU—ITS CANYONS AND RUINED CITIES.

A LECTURE on this subject, the last in the course of the American Institute, was delivered Jan. 28, by Prof. NEWBERRY, of Columbia College.

The speaker alluded casually to the fact that "Uncle Sam" is continually adding to his farm, and, as he does so, must of necessity send out parties to explore his newly-acquired possessions. The Professor was connected with various exploring parties for a space of about five years, an experience both agreeable and trying. A part of the results of these explorations was selected as the subject of the lecture.

The party to which he was attached left Fort Yuma in January, 1858. The party had the navigability of the Colorado to determine. At that time it was an unknown river. There were many rumors afloat about it. It was an uncanny river, abounding in rocks and rapids; it flowed in cañons so deep that men had perished on the banks for want of the water they could see but could not reach. So little was known of the river, that a land party was provided as well as one to explore by water. For the use of the latter the government had a small iron steamer, sixty feet long by thirteen wide, built at Philadelphia, and sent out in sections. This was a little "wheel-barrow" boat, as they are called on Eastern waters, having a large paddle-wheel at the stern, and a small cabin, with the forward part of the boat open. It displayed a wonderful amount of ingenuity, in being totally unfit, in all points, for the use for which it was intended—drawing some three feet of water, when the smallest possible amount was required.

For the first five hundred miles, the general course of the river is north and south. It makes a bend to the east, and flows through the great cañon. The chief rivers flowing into it are the Little Colorado, the San Juan, and the Green. Twenty miles above Fort Yuma the party were beyond the knowledge of the officers of the fort, though they had been in garrison there some years. It was a completely unknown country. The party were the first white men who had ever visited the basin through which the river flows before reaching the vicinity of the fort. The country was mostly a sandy gravel desert which formed *mesas*, or table-lands, between mountains of volcanic origin. This was not entirely uninteresting, as the mountains were variously colored, and on the deserts as found the cactus, sometimes shooting up in a single column sixty feet high. They found no falls or other great impediments to navigation; at times a mountain would seem to bar entirely further progress; but as the steamer approached, an opening would appear, and in these passages the sailing was even better than in the other parts of the course. About half-way up the river the party entered the Mojave Valley. The Mojave Indians are almost cut off from friends and foes by their position. They had been visited by only one or two parties of whites. They were the best race of men the speaker had ever seen. Some were of beautiful form, models even for a sculptor. Unlike other Indians, they are bold, and very brave. Their arms are bows and arrows and short war-clubs. After discharging their arrows, they charge upon the enemy, and terminate a battle by hand-to-hand encounter. They live almost entirely without animal food. The river rises like the Nile, overflowing its banks, and in the bottom lands corn grows almost without care. The valley has little animal life. The people are fond of amusements, and assemble to enjoy games. In these, the old men join, while the boys look on. The climate of this valley is quite peculiar, the average temperature being between 80° and 85°, while the height to which the mercury goes in the summer depends on the length of your thermometer. It is certain that it often goes as high as 120°. These Indians are a more interesting subject, from the fact that having had no communication with the whites, they resemble the Indians when the whites first visited the country. Few have a perfect knowledge of the Indian as he was before contact with civilization. In some respects he resembles a child. He is an undeveloped man. He has fidelity, a sense of justice, greets the whites as friends until he has cause for regarding them as enemies. An instance of this kind was narrated, showing that the aggressions have chiefly been on the part of the whites.

One chief, CAIROOK by name, befriended the party in many times where the aid of a friendly Indian was especially valuable. He showed himself a real friend of the whites. Afterwards a party of Missourian emigrants passing through the country, the first that had ever crossed on the thirty-fifth parallel, got into some dispute with the Indians, whom they treated like those they had previously dealt with; but the Mojaves were a very different people, and in self-defence attacked the whites. In the battle some twenty-two of the latter were killed. Of course, as in duty bound, we sent soldiers to punish the Indians. Although they made a brave defence, bows and arrows were not just the thing to pit against the Minié rifle, and they were conquered. They then pleaded that the whites were the aggressors; and hostages being demanded of them till such time as the matter could be investigated, several of the leading men volunteered—among them CAIROOK. The long delay of justice, and their confinement under guard in a fort, made them at last despair that justice would ever be done, and so they resolved to escape. Having no arms, it was resolved that one of them should pinion the guard while the others fled, and for this CAIROOK volunteered. Being a powerful man, he held the sentry powerless, while the others got off in safety. The guard being aroused, came up, and CAIROOK was killed. Of this man Lieut. IVES says—"He is a noble looking man, nearly six feet and a-half high, and has a magnificent figure, and a fine open face."

The great bend of the Colorado was the objective point of the expedition, as the government wanted a base of supplies for the army operating at that time in Utah. When they part reached this bend, they had only sixty days' provisions, and were some five hundred miles from Fort Yuma. They lived upon corn and beans alone for a long time. Vegetable, without seasoning or animal food, becomes in a short time inexpressibly nauseating. Early in March the party in the steamer reached the Black Mountains, and the limit of navigation, where the walls of the cañon are eight hundred feet high, and the whole depth from the surface is from one thousand two hundred to one thousand five hundred feet. As the boat was passing along near this place at her greatest speed (only seven miles per hour, however), each man at his post, but all intent upon the scenery, the boat was stopped so suddenly that everybody was pitched forward. The fireman followed a stick of wood into the furnace, and was pulled out by the legs, minus his hair and beard. The man at the bow with the sounding rod, who a moment before had been unable to find bottom at fifteen feet, now was pitched overboard. Steam pipes were doubled up, and things in general strewed about. The cause was a sharp pinnacle of rock, rising to within a few inches of the surface. Fortunately, it struck the boat exactly in the stem. An inch either way, and there would have been a sudden end of the Colorado expedition, as the boat would have been utterly destroyed.

The party then retraced their steps, and the remainder of the explorations were on land. The Colorado plateau is a continuation of the great Salt Lake basin. It is mostly formed of sedimentary rocks, at the bottom of which is granite. The Columbia drains a similar plain. Reaching the Colorado plateau, they found it creased with furrows or gulleys. Finally, descending into one of them, they traced it to a watering place, which they found surrounded by a peach orchard—a common occurrence about the wells and springs. The seeds originally came from Mexico. Following this stream, called Diamond Creek, to the Colorado, they found it joined the river three thousand feet below the surface of the plateau. All these cañons, or river beds, have been excavated by the water through the sedimentary rocks, and sometimes six hundred or eight hundred feet through the granite below. In some cases these walls drop the whole of the three thousand feet at one step. The lecturer then presented details in relation to these wonderful river beds, and illustrated with diagrams and paintings some of the most remarkable points.

In going north they came, from time to time, upon ruins of Moqui towns and cities. This people once inhabited the whole surface of these plateaus. The towns were always situated upon the edge of high bluffs, or in positions easily defended. They are built of what would be really fine masonry in this part of the country. The only approaches to these cities were by stairways leading up through defiles, where a few men could hold an army at bay. Many of these cities were in ruins, but some are still inhabited. The people cultivate the plains, but live on the hills. The shape of these plateaus (for such a large part of these hills are) is very favorable for this purpose. In one of these a very large town or city is so situated that there is only one way of approach. The hill presents perpendicular walls on all sides. The towns have no gates, the only means of entrance being ladders. The lower storeys of all the houses around the town have no windows, and form, in fact, a wall shutting in the whole town. The windows above this first storey are furnished with shutters. The women are to be seen in the morning going down to the cisterns with earthen vessels for water. These vessels will hold about two pailfuls each. Pottery is much used among them, as they have very little wood. The pottery is made with a wheel, is painted in tints, and is applied to almost every use. The party were invited into one of the best of these Moqui houses. A dish with water, another of salt, and a third with what seemed a ream of blue blotting paper, was placed before them. They were at a loss to know what was to be done, until the host showed them. The blotting paper was bread. A bit was torn off, dipped in the water, then in the salt, and then eaten. The corn has a decided blue tint, and the meal and bread made from it are of the same bright color. The dough is poured upon a heated flat stone, and another hot stone at once placed over it, by which means it is almost instantly cooked. It was very good, for they are fond of fresh bread, and keep it sweet.

They had had no intercourse with the whites. Little could be learned about what they worshipped; but it is known that they keep fires constantly burning day and night, never suffering them to go out. They also have certain ceremonies at sunrise. They have travelled roads, and their towns are supplied with water from cisterns filled by water brought in pipes. The guides, when travelling and coming to water, would, before drinking, sprinkle meal about the spring, and, suspending a little cotton from a stick, allow it to dip into the water. As it drew up the moisture, and became wet, they thought the spirits were appeased. They are of a copper color, but are much lighter than the Indians; they have not the high cheek bones and aquiline noses of the other tribes. Their girls are very light in color and quite pretty. They are intelligent and ingenious, good architects, and famous potters. As far as the speaker could judge, their morals are good, and they are without the usual vices of the Indian character. They are remarkably neat, both in person and in household arrangements. An instance was mentioned in which a bit of litter upon the floor was at once removed by the "lady of the house" with a "dust-pan and broom."

Their industry is proverbial. Hedges of dry sticks protect the plains where they raise their crops from the blighting effects of the winds, which sweep with terrible force across the plains. On account of the peculiar nature of the light, dry, sandy soil, it is necessary to plant the corn a foot deep. This is done with a stick, and in this way it reaches the moisture below, and produces very fair crops.

The San Juan was the next point visited. Along this river there is scarcely a mile without its ruin. They take here more the form of citadels. One was spoken of, with walls of sandstone twenty-five feet high, nicely fitted, and then rubbed to a surface, as is the case with us where we want a very nice piece of work. In this instance it was probably done to present so smooth a surface that it would be impossible for an enemy to scale the wall. Some of these towns have been abandoned for hundreds of years, and all the wood-work and other perishable parts are gone; while in others the cedar wood, plaster, doors, etc., were intact, showing that they could not have been long abandoned. There is at present no water along this section of country. The necessary supply must be carried by the traveller. The towns were supplied for irrigation, etc., by canals, the remains of which can be traced for miles. The country at one time probably held a population as large as it was capable of supporting.

The problem of the disappearance of this people is one of great interest. It has been suggested that, having been connected with the ancient Mexican empire, it perished by means of the withdrawal of so many recruits at the time of the Spanish conquest. There is not a word of truth in this story, the true reason being that the Moquis were surrounded on all sides by hostile tribes—the Apaches, Navajoes, and others. These have continually made inroads upon the Moquis, until only those towns in the most impregnable positions remain. One of these towns was surrounded by a precipice some two hundred feet high. The San Juan ground is moreover debatable territory. It has never been occupied by the whites.

The Moquis make beautiful blankets, specimens of which were exhibited. They are made from the wool of a kind of black sheep, which has from four to six horns. Black being the natural color of the wool, all other colors must be artificially produced. The colors of the blankets were white, red, black, blue, brown, and the patterns pretty and regular. Though the yarn is not spun as hard as ours, the fabric is so firm and close that a pailful of water poured into a blanket held by the four corners will be hours in penetrating, and yet the stuff was quite soft. The speaker said they dressed handsomely and in good taste. The ladies' hair was also well dressed—fully *equal to ours!* Their shoes are quite peculiar; they are made on a last, the sole being thick like ours, and very black. It is turned up all round the foot. The upper is of red buckskin, and is sewed to the sole.

The lecture was listened to with great interest by a large audience.

The Roads of New York Central Park.

By WILLIAM H. GRANT, Superintending Engineer.

XII.

In concluding this discussion, I give the following detailed—

SPECIFICATIONS FOR LAYING DRAIN-PIPES FOR THE SURFACE DRAINAGE OF ROADS, AND FOR SILT-BASINS.

1. Drain pipe for surface drainage, to be glazed vitrified pipe (or cement pipe);* none to be used that are fractured, or that are not well burned and glazed. The sizes to be adapted to the distances drained, and to a maximum rainfall of two inches in depth per hour on the road surfaces.

2. The bottom of the trench to be made true and even, and of such depth as to admit of not less than three inches of covering over the pipe.

3. The joints of the pipe to be laid with the hub, or socket-end, up stream, and always, when practicable, the pipe to be laid in the up-stream direction.

4. The joints to be carefully and thoroughly filled with mortar made of three parts of clear sand and one part of good hydraulic cement. Apply the mortar to the hub end of a joint that is laid, filling one-third of the lower portion of the socket; then place in position the small end of the next joint of pipe, pressing it down into the mortar until it is truly centred, the opposite, or hub end, being also well bedded in the trench at the same time, so as not again to be disturbed; next, fill from the outside the balance of the socket, and press in and smooth off the mortar with a trowel all round; then draw out, with a simple instrument, any mortar protruding from the joint within the pipe.

5. After giving the mortar time to set, pack the earth well under the pipe, between the ends, and along the sides. This work, and the filling of the trench until the pipe is securely covered, must be done by men well instructed, in order to avoid disturbing the pipe by any unequal pressure or carelessness. The finest earth, free from stones, must be selected for the purpose, the balance of the trench to be filled, in even layers, of not over nine inches in depth, and each layer to be well rammed.

6. Where bends occur in the trench (to avoid rocks, or for other causes) the pipe must be laid with great care; if the bends are short, curved pipe must be used.

STONE BREAKING MACHINE.

The drawing of this machine that was alluded to in a previous part of these articles is omitted, as a similar drawing will be found in the advertising columns of this journal, to which reference is made.

The Stetefeldt Furnace.

WE give this week a complete description, together with a fine illustration, of the furnace of Mr. CHARLES A. STETEFELDT, for chloridizing silver ores, the great success of which is now fully established, and will effect a decided improvement in the net returns of many of our mining districts. This description is the most trustworthy hitherto published, and may receive the confidence of our readers, as the statements contained in it are confirmed by the best authority.

* Mention has been made of this pipe heretofore; owing to the closeness of inspection required, and the liability of imperfect pipe getting into the work, but a small amount was used.

THE ENGINEERING AND MINING JOURNAL.

CONTENTS FOR THIS WEEK.

[*Illustrated Articles are marked with an asterisk.**]

*The Stetefeldt Furnace..... 97
The Moisie Iron Works, Canada. 98
American Mining and Metallurgy from a Foreign Standpoint.... 99
Mining Review for 1869, Continued..... 100
BUSINESS AND PERSONAL..... 101
MARKET REVIEW..... 102
Mining Companies and Stock Quotations..... 103
American Institute Lectures.... 104
The Roads of New York Central Park..... 104
EDITORIALS:
The Stetefeldt Furnace..... 104
Geological Explorations in the West..... 105
Can we Construct Ships in this Country?..... 105
A New Mode of Railroad Car and Boat Propulsion..... 105
The San Jacinto Tin Ore..... 105
Railway Safety Stove..... 106
Humboldt..... 106
Spectrum of the Fire-Fly..... 106
The Mouth of the Mississippi... 106
A Singular Phenomenon..... 106
The Advantage of Public Surveys 106
A Long Truss Bridge..... 106
ADVERTISEMENTS..... 106

ROSSITER W. RAYMOND, Ph. D., Editor,

PUBLISHERS' ANNOUNCEMENT.

THE ENGINEERING AND MINING JOURNAL *is projected in the intent of furthering the best interests of the Engineering and Mining public, by giving wide circulation to original special contributions from the pens of the ablest men in the professions. The careful illustration of new machinery and engineering structures, together with a summary of mining news and market reports, will form a prominent feature of the publication.*

SUBSCRIPTION—**$4** *per annum in advance;* **$2 25** *or Six Months.*

ADVERTISEMENTS.—*The rates are as follows: Inside pages,* **25** *cents per line each insertion; the outside or last page,* **40** *cents per line. Payment required in advance.*

NEWS-DEALERS *will be supplied through the agency of the* AMERICAN NEWS COMPANY, *No.* 121 *Nassau street, New York City.*

COMMUNICATIONS *of all kinds should be addressed to the Publishers. The safest method of transmitting moneys is by checks, or Post-office orders, made payable to their order.*

Correspondence and general communications of a character suited to the objects of THE ENGINEERING AND MINING JOURNAL *will always be welcome.*

The Postage on THE ENGINEERING AND MINING JOURNAL *is twelve cents a year, payable quarterly, in advance, at the office where received.*

GEO. E CUMMINGS *is our Agent at Philadelphia. Office,* 429 *Chestnut street.*

WESTERN & COMPANY,
Publishers and Proprietors,
37 PARK ROW,
P. O. Box, 5969. NEW YORK CITY.

Geological Explorations in the West.

WE have recently received two works from the pen of that indefatigable field geologist, Professor F. V. HAYDEN. The first of these is the geological report of the exploration of the Yellowstone and Missouri rivers, conducted under the general direction of Captain (late Lieutenant-Colonel) W. F. RAYNOLDS, United States Engineers. The expedition took place in 1859 and 1860; but the publication of its results has been long delayed. Colonel RAYNOLDS himself, when not disabled, was actively engaged in the field during the war; and has since made but a brief itinerary report of this work. Dr. HAYDEN's geological report appears to have been transmitted in March, 1867, and contains some material collected as late as 1866. It may in fact be regarded, in his own words, as his final official report upon the geology of the great region drained by the Missouri river and its tributaries, and as, consequently, the matured fruit of the labors of many years. While explorations of this kind are in progress, and before they have established tangible general results, their records are dry and uninteresting to the ordinary reader, even though he be a scientific expert, unless he is himself interested in the controversies and problems that are presented by the details of the work. The occurrence of an *ammonite* here or a *baculite* there, and the vehement discussion of its signification, merely whet the appetite, which is only to be satisfied by the connected final results of all these observations. In other words, even geologists pay comparatively little attention to these preliminary labors, until they culminate in a careful geological map. This at once makes everything clear. Around it the single observations group themselves in appropriate order and significance. It forms a basis for future corrections and additions, and for the elaboration, to the highest theoretical and practical perfection and value, of the systematic geognosy of the region concerned.

We are glad to see, therefore, that this report is accompanied with a finely-executed geological map. The country covered embraces on the south a large portion of the route of the Union Pacific railroad, from the Platte valley to Bear river, and the valley of the Missouri through Nebraska, Dakota and Montana. The whole of Wyoming, and a portion of Idaho, with nearly all of Montana, are included. West of the Rocky mountains, however, the map is wanting in geological details, the whole country being "laid in" with an agreeable salmon-color, which denotes, as the text informs us, "granitic, metamorphic and basaltic" formations. This only needs an "etc." to be quite accurate. It is east of that range that Dr. HAYDEN has labored; and here the map is scarred like a battle-field with the traces of fierce controversies. Geologists will not fail to notice how strongly the bright green of the cretaceous is contrasted with the dull yellow of the "lignite tertiary." No Fenian in his guarded tent, at midnight dreaming of the hour, etc., ever planted the emerald flag in Pall Mall with greater triumph than that of the valiant HAYDEN, spreading his victorious colors over the scenes of conflict. Possibly the ghost of MARCOU, or the living presence of LE CONTE, may arise again to contest the field; but the probabilities are that the victor will be allowed in peace to bind upon his brow the thrilling motto: "No cretaceous coal west of the Mississippi!" The evidence of his conquest is now in black and white, but [also green and yellow!

Prof. NEWBERRY contributes to this volume a report on the cretaceous and tertiary plants, which incidentally sums up, in a masterly way, the results of observation thus far, with regard to the physical geography of this continent during the cretaceous and tertiary periods. As these periods immediately precede those which ushered in the human race, the questions connected with them have peculiar interest. What did they write on the grand continental slate, to be scratched by glaciers, or washed out by rivers? and what remains of their work in existing topography, or in fauna and flora, despite these later rude erasures? Prof. NEWBERRY's brief reply to these questions is a fine specimen of clear and trustworthy generalization.

Prof. HAYDEN's preliminary field report of the geological survey of Colorado and New Mexico is also published. It contains in small space a good deal of interesting material, but no complete and systematic results. The familiar question of the age of the lignites is handled over again, and a number of valuable analyses of coal are communicated. The preliminary report on the mines and minerals of Colorado, by Mr. PARSIFOR FRAZER, jr., is too restricted to be useful; and we cannot honestly say that we wish it were longer. It amounts to nothing more than a transcript from a note-book of travel, interspersed with bits of Bunsbyism like the following, which refers *(mirabile dictu!)* to the treatment of tailings:

"While the adjustment of such complicated questions as these is one which must wait the lapse of time and the course of events, it would be well for interested parties to consider in what way to manage their property out here so as to assure themselves against present possible loss, and of future increase in its value. *To do this without radiating prosperity on all around them, and building up the wealth and power of the country, is a problem which will tax their abilities to the utmost, however great those abilities may be.*"

Mr. FRAZER possibly means to say that wise economy in working mines will benefit the public as well as the owners—which is quite true, though scarcely novel; but the picture he gives of "interested parties," taxing their great abilities in vain to solve the problem how to be prosperous, "without radiating prosperity," though quite novel, is not at all true. Prosperous men do not strain themselves to avoid "radiating." That centrifugal operation is half the fun of prosperity. Meanwhile, if that or any other problem is troubling the citizens of Colorado, they may as well continue to "await the lapse of time and the course of events;" for they will get no help from the pages of Mr. FRAZER.

The monograph of Mr. CYRUS THOMAS, on the agriculture of Colorado, which closes the volume is interesting, compact and well-arranged. It gives a clear picture of the present condition and future capabilities of this fruitful territory, and cannot fail to impress the mind of the reader with Mr. THOMAS's own opinion, that Colorado, at no very distant day, is destined to become one of the chief agricultural sections, as it is now one of the principal mining fields, of the Rocky Mountains.

Can We Construct Ships in this Country?

THE decadence of American commerce has at last attracted the attention of the country, and some legislative action is demanded which shall tend to revive our shipping, and give us again the position among maritime nations which we held before the war. The only question about which there is any doubt, is how we can construct vessels in this country to compete with English-built ships. Many say it is impossible unless the Government grant subsidies, to build ships here at all. If this is so, it would be better to build no ships; since to grant subsidies is merely to encourage and sustain a few lines at the expense of the general shipping interest. Others again say, let the Government grant a sufficient bonus to each ship built, to cover the difference in the price of the material and labor between this country and England. Both of these propositions are made for the same end—to make up the greater cost of construction in this country caused by the high duties; whether the duties could be lessened or not is a question affecting all the manufactures of the country, and not to be settled without meeting with opposition from parties interested in other pursuits.

A third party (and this includes most of our iron-ship builders), urges, we think, more judiciously, that we shall be permitted to construct vessels upon the same terms as England grants to her ship-builders. The bulk of our commerce, it is argued, will be international; in competing for that trade, our great rival is England; and to build vessels to compete with her, we must be granted the same privileges which her builders enjoy. These are, that all materials used in the construction, equipment, or outfit of vessels built in her ports pay no duty and no tax to the Government. England, for many years, has paid the greatest attention to her commerce, encouraging it by such legislation as would tend to cheapen construction, and only granting subsidies where it was deemed wise to open new channels of commerce.

She collects from that which is brought to her shores in the vessels she has enabled her builders to construct, many times the whole value of the vessels themselves. By cheapening her vessels she adds to their number and increases her commerce and national wealth.

Let this policy be pursued here, and we can as successfully rival her in iron hulls with steam machinery, as we did in wooden hulls with sails. We can make engines which shall be as powerful and as economical as the most successful the English have constructed, by copying them, even without improvement. Under sails, our vessels, as a rule, were better carriers, faster, and more easily handled, and requiring fewer seamen, because our models were better. The same ability which enabled us then to design better vessels still remains. Our iron-ship builders are well aware of all the latest improvements which have been introduced in the construction of the hulls, and our workmen, though requiring greater wages, do more work, the difference in wages, some of our shipbuilders maintain, being amply made up in the amount of work done.

A line of first-class vessels, fitted with the most economical engines which have been so far designed, modeled upon the American system of great beam and comparatively light draft could underbid in freights any vessels now running from this port, and all being new, would not have to aid vessels constructed years ago, as do the recent additions to the foreign lines.

We want no subsidies, we want no bonus; all we want is permission to build our vessels upon the same terms as are granted by our great rival to her builders. Our rolling mills and furnaces would lose no trade as they now have; for no ships are built now. Rather would they gain, as some of the material used would have to be obtained here. Our ship-yards would be enlarged and multiplied, and the Government, in case of war, would have not only vessels at command, but would have within the country, ready developed, the means of immediately constructing men-of-war, to meet any emergency which might arise. Last, not least, our flag would again, at the mast-head of our merchant vessels, be seen in all the ports of the civilized world, where now its absence brings a blush of shame to the cheeks of our citizens.

A New Mode of Railroad Car and Boat Propulsion.

MR. (late General) BEAUREGARD, who has been for some years past engaged in the consideration of the subject of simplifying and rendering cheaper the propulsion of railroad cars, has secured a patent under which, it is believed, his ideas on the subject will be carried to a success in every respect gratifying to the public. Mr. BEAUREGARD calls his invention a system of contraction, and will ere long put it into practical operation on the New Orleans and Carrollton Railroad, of which he is President. He describes the invention as follows: "This invention relates to new and useful improvements in machinery or apparatus for propelling cars or other vehicles on land, and boats on canals or rivers, by means of overhead wire or other rope, deriving motion from stationary engines or other power, at intervals along the route—the invention comprising an arrangement of clamping devices for engaging and disengaging the rope, having a constant movement above a roller or pulley supports for it, suspended from framing along the road, the clamp being connected to brackets, upon the car, by a spring or yielding connection, to relieve the car or boat from injurious shocks at starting, and arranged to be operated by the conductor in the car, vehicle, or boat. The invention also comprises an arrangement of means for raising the rope, when it is to be clamped for setting the car in motion, the pendant supports of which are necessarily lower than the clutch, to permit it to pass over them, also arranged for operation by a person standing on the car. In carrying out this invention the railroad track will be spanned, at intervals of about two hundred feet, by a framework consisting of two upright posts, connected at the top by a cross-beam, from which will descend a bracket, to which will be affixed a roller to support the traction rope. The clamping arrangement will be controlled by a crank, worked by means of a cord passed round a wheel, and within easy reach of the conductor of the car. When the car is to be put in motion, the traction rope is made to pass up between two check pieces fixed to a block, and on a rod supported by two curved brackets rising from the roof of the car, above the roller which supports the rope, the supporting brackets of which are also curved, but in an opposite direction, permitting the blocks and clamps to be carried above the roller supports of the rope, without any interference with either set of brackets. To the front of this block in which the clamps are situated, and of the upright curved bracket in the centre of the car roof, is a piston rod, supported by another curved bracket at the rear, and on this piston rod works a spiral wire, enclosed in a cylinder, this being the chief power employed to prevent injurious shocks when the car is either started or stopped. The clamps through which the ropes are passed are perforated by a right and left screw, connected with another wheel, around which a cord is passed, by pulling which the conductor of the car can set this screw in motion, thus bringing the clamps together and stopping the motion of the traction rope. In this matter the conductor will also have the aid of the ordinary car-break. When passengers have got out of or entered the car, it can again, and without shock, be put into motion by taking off the car-break, releasing the cord which works the screw through the clamps, and at the same moment elevating to the proper height the roller block which supports the traction rope. This invention, in the opinion of Mr. BEAUREGARD, can be applied on branches of trunk railroads, and on plantations, wherever the surface is not too broken, as well as to canals, even when they are frozen, and ordinary traffic on them entirely suspended, for boats may be placed on rollers and propelled over the ice, while very simple machinery will enable them to overcome the locks in their path."

The San Jacinto Tin Ore.

LETTER FROM PROFESSOR ROESSLER.

WASHINGTON, D. C., February 7th, 1870.

TO THE EDITOR—Sir: I have submitted an average sample of the tin ore from San Jacinto, California, to the able and distinguished chemist and mineralogist, Dr. F. A. GENTH, of Philadelphia. The percentage of metallic tin derived by him from the ore, is 13.37—twice as much as the usual working ores of the tin mines of Cornwall, England. The black mineral in the ore is tourmaline, (it contains boracic acid) and the brownish-red is cassiterite. It is a highly interesting occurrence.

A. R. ROESSLER.

Railway Safety Stove.

ON Saturday, February 5th, we had the pleasure of attending the trial of a new railway stove, at CUMMINGS' car factory, in Jersey City. It was to all appearance an ordinary box stove, covered with an ornamental jacket, and presenting a very neat appearance. The fire was lighted, and the wood piled in, until the stove was full. In the course of a half hour, the wood was well on fire, and the outside of the stove beneath the jacket was red hot. In fact, it was a stronger fire than could ordinarily occur in a similar stove in actual use. A bed of splintered pine wood was then prepared, to represent such splinters as might be expected in railway accidents of the worst kind. The word was then given, and three men tipped the red-hot stove over on the splinters. In just thirty seconds by the watch, every particle of fire was out; the outside casing was made so cool that shavings held upon it from the moment it went over, were not scorched. In fact it was evident to every one, that it would have been utterly impossible for a car, under any circumstances, to take fire from the stove.

The stove itself is a box of boiler iron, with a tank below, also of wrought-iron, and having nearly as great a capacity as the stove itself. This tank is six or seven inches deep, and projects several inches around the box, forming a base for it. The tank, which is filled with water, is separated from the stove by a cast-iron plate, in which are four holes, closed with loose iron valves. An air space of four inches separates the fire from the water, and prevents the heat from reaching the latter. An iron plate, suspended by chains from the top of the stove, permits the escape of the gases to the funnel, but when the stove is thrown from an upright position, closes the funnel entirely. In case of an accident, where the stove would be upset, and the valves fall from their places, the water deluges the fire, which is prevented from entering the pipe by the swinging valve. In case of the stove being collapsed, the water would be forced out, so as to extinguish the fire, while the material of which the stove is made will prevent its bursting open so as to allow the fire to escape.

Several gentlemen professionally familiar with railroad affairs were present at the trial, and in most unqualified terms expressed their conviction that the stove is what it professes to be, and that, in all cases where fire might, by the upsetting or crushing of ordinary stoves, be communicated to the wreck of a car, this device will effectually prevent the added horror, suffering and loss so occasioned.

Humboldt.

ROBERT VON SCHLAGINTWEIT has published some interesting personal reminiscences of Humboldt. So far as the philosopher's habits of life may be supposed to throw any light upon his remarkable health and longevity, the details are curious. It appears that, although he slept but little, he remained in bed as long as most persons. He was accustomed to regular hours of study and a certain unbroken routine of life. He had no taste for mere recreation in early life, and it is not known that he ever danced or played a game of cards. During his travels he occasionally smoked, but rather for the purpose of keeping off malaria or mosquitos, than from any pleasure in the habit. During the last sixteen years of his life he never walked out, yet his health was not affected, either by sedentary habits or the close atmosphere in which he lived. His voice was clear and his eye bright to the last, and his death came naturally from the exhaustion of the physical functions.—*Medical and Surgical Reporter.*

Spectrum of the Fire-Fly.

PROFESSOR C. A. YOUNG says this is "perfectly continuous, without trace of either bright or dark lines, and extends from a little above FRAUNHOFER'S line C, in the scarlet, to about F in the blue, gradually fading out at the extremities. It is noticeable that precisely this portion of the spectrum is composed of rays, which, while they more powerfully than any other affect the organs of vision, produce hardly any thermal or actinic effect. In other words, very little of the energy expended in the flash of the fire-fly is wasted. It is quite different with our artificial modes of illumination. In the case of an ordinary gas-light, the best experiments show that not more than one or two per cent. of the radiant energy consists of *visible rays*; the rest is either invisible heat or actinism; that is to say, over ninety-eight per cent. of the gas is wasted in producing rays that do not help in making objects visible."

The Mouth of the Mississippi.

THE report submitted by the Engineer Department, on the work of deepening the passes from the Mississippi to the Gulf of Mexico, shows that Pass a l'Outre, the one selected for improvement, has been deepened from eleven to seventeen feet, the channel being one hundred and seventy-five feet wide. The current, however, will soon reduce it to its former condition if the labor upon it is relaxed. The digging is done by a dredge-boat, constructed especially for the purpose, at a cost of about $300,000. In order to keep open two channels, the building of two more dredges is recommended, after which the annual cost of keeping the channels open would be about $200,000.

A Singular Phenomenon.

ON Thursday, August 19th, the soil covering several yokes of land a few leagues from the town of Steyer, Austria, suddenly fell in with a crash, and a lake appeared. The water is clear and temperature very low. Though the river Steyer passes the place at no great distance, it does not appear that any communication exists between them. The water of the stream is said to be chemically different from that contained in the newly-discovered reservoir. The locality is situated at a considerable elevation above the level of the sea, and the spot where the lake is now to be found was before this a gently undulating plain.

The Advantage of Public Surveys.

THE Prussian Government has military maps of every foot of its territory, so complete that every hill, ravine, brooklet, field, and forest is delineated with perfect accuracy. It is a common boast of Prussian military men, that within the space of eight days, 848,000 men can be concentrated to the defence of any single point within the kingdom, and every man will be a trained and well-equipped soldier.

A Long Truss Bridge.

ONE of the longest wooden bridges in New England was finished a few days ago, at Mason Village, New Hampshire, on the Peterboro' and Shirley branch of the Fitchburg Railway. It is of the kind called Howe's Truss Bridge, and is six hundred feet long, and in some places elevated one hundred feet.

MISCELLANEOUS.

CORLISS STEAM ENGINE COMPANY.,
(Incorporated June, 1856.)
GEORGE H. CORLISS, PRESIDENT.
WILLIAM CORLISS, TREASURER.
PROVIDENCE, R. I.,
MANUFACTURERS OF
STATIONARY AND MARINE ENGINES AND BOILERS.
Engines ranging from **15 h. p.** to **1,000 h. p.,**
FURNISHED ON SHORT NOTICE.
These Engines, manufactured under the several patents granted GEO. H. CORLISS, secure a perfectly uniform motion, under all variations of resistance, and SAVE THEIR COST IN FUEL IN FROM 3 to 5 years. Our facilities and capacity are unsurpassed by any establishment in our line. Sept 28 tf

DUNCAN, SHERMAN & CO.,
BANKERS,
Corner of Pine and Nassau Streets, New York.
Circular Notes and Letters of Credit for Travelers, available in all the Principal Cities in the World.
TRANSFERS OF MONEY TO EUROPE AND THE PACIFIC COAST BY TELEGRAPH.
Interest allowed on Deposits. feb-1y

UNITED STATES ASSAY OFFICE,
No. 30 Wall Street, New York City.
Gold and Silver Bullion, Jewelry, Foreign Coins, &c., received on deposit in amounts not less than $100 in value, and returns made, as soon as assayed, in coin or fine bars, at the option of the depositor, and on the same conditions as at the U. S. Mint. Bullion sent through the agency of Express Companies should be accompanied by explicit instructions as to return of proceeds
GEORGE F. DUNNING,
nov 2:1y Superintendent.

AGENTS AND CANVASSERS WANTED
IN EVERY CITY AND TOWN IN THE UNITED STATES,
FOR THE
Engineering and Mining Journal.
Liberal inducements. Specimens sent free. Address
WESTERN & COMPANY,
37 Park Row, New York.

ED. SEARS' WOOD-ENGRAVING ESTABLISHMENT.
Engraving, Designing, and Photographing on Wood, in all its branches, viz: Portraits, Fine Book Work, Machinery, Maps, Buildings, Illustrated Catalogues Views, etc.
N. B. Special attention given to Color Work of all descriptions.
48 *BEEKMAN STREET, NEW YORK.*

PUBLICATIONS.

"THE
MANUFACTURER and BUILDER"
AN ILLUSTRATED MAGAZINE OF INDUSTRIAL PROGRESS.

Aside from those purely commercial objects which form the mainspring of every business undertaking, the publishers of THE MANUFACTURER AND BUILDER seek to promote the *diffusion of useful, practical knowledge*, and to furnish to those engaged in the industrial arts a journal which will enable them to keep abreast of the wonderful developments which in these modern times result from the application of science to the arts. Without being trammelled by any special classification, or confined in its scope by the narrow limits of any particular trades or professions, they would offer the following synopsis as presenting a few of the prominent topics which have been discussed in its pages.

ARCHITECTURE.

This subject has been treated both as one of the fine arts and as a means of providing shelter for man and his works. Every improvement connected with the art of building, whether that improvement relates to beautifying the appearance, increasing the value, strength, and durability, or lessening the cost of erection, finds a legitimate place in its pages.

THE MOTORS.

Amongst the great agents in the improvement of the arts, none are more important than the Motors—steam, water, and wind. These, in all their various modifications, will receive full attention, and every improvement will be carefully noted and discussed.

SCIENCE APPLIED TO THE ARTS.

As, for example, the application of modern chemical discoveries to dyeing, of electricity to various processes, of magnetism to the examination of iron, have all received attention at the hands of the editors.

THE HOME DEPARTMENT

Is devoted to matters of immediate interest to the domestic circle, whether that matter be of practical or merely general interest. In short, everything of interest to our American homes may here be legitimately discussed.

ILLUSTRATIONS.

In connection with these varied subjects, the journal, during the first six months, contained upwards of 150 illustrations, some of which were of a degree of artistic excellence rarely seen in purely technological journals.

FORM AND SIZE.

Each number of THE MANUFACTURER AND BUILDER comprises 32 large quarto pages, cut, stitched, and bound within an engraved cover. At the close of every year subscribers have a book, when bound, of

384 Pages, with upwards of 300 Engravings.

In presenting to the public the peculiar features of THE MANUFACTURER AND BUILDER, we have preferred to speak in the past tense. We have referred to what we have done as an earnest of what we hope to accomplish in the future. One object that we have kept steadily in view is the increase of our circulation, so that, as an

Advertising Medium,

THE MANUFACTURER AND BUILDER may ultimately rival any journal in the country. We have sought to effect this by placing the subscription price at the extremely low figure of

One Dollar and a Half per Year,

with liberal discounts to those who may get up clubs.

The advertising rate is $3.75 for one-half inch space per month, or 75 cents per line each insertion. Special contracts made for long periods.

A specimen copy of THE MANUFACTURER AND BUILDER will be sent free to parties contemplating advertising or getting up clubs.

Address,

WESTERN & COMPANY, Publishers,
37 Park Row, New York.

PUBLICATIONS.

THE MINES OF THE WEST:
A REPORT TO THE
SECRETARY OF THE TREASURY.
Being a full Statistical Account of the
MINERAL DEVELOPMENT OF THE PACIFIC STATES
for the year 1868, with
Sixteen Illustrations,
and a Treatise on the Relation of Governments to Mining, with a delineation of the Legal and Practical Mining Systems of all Countries, from early ages to the present time. By
ROSSITER W. RAYMOND, PH.D.,
U. S. COMMISSIONER OF MINING STATISTICS.

CONTENTS:

INSTRUCTIONS FROM THE SECRETARY OF THE TREASURY.
LETTER OF THE COMMISSIONER TO THE SECRETARY.
REPORT:
PART I.—Observations of the present condition of the mining industry:
SECTION I.—*Notes on California:*
Chapter I.—The new Almaden mines.
II.—The Mother Lode of California.
III.—The quartz and placer mines of Nevada County.
IV.—Giant powder and common powder.
SECTION II.—*Notes on Nevada:*
Chapter V.—Present condition and prospects of the Comstock mines.
VI.—Ormsby, Washoe, and Churchill Counties.
VII.—Lander County.
VIII.—Nye County.
IX.—Lincoln County.
X.—Esmeralda County.
XI.—Humboldt County.
SECTION III.—*Notes on Montana:*
Chapter XII.—General geological features.
XIII.—Population, property, railroad, etc.
XIV.—Placer mines.
XV.—Quartz mines.
XVI.—Operations of the United States law.
SECTION IV.—*Notes on Idaho:*
Chapter XVII.—Report of Mr. Ashburner
XVIII.—The War Eagle tunnel.
XIX.—Bullion product.
SECTION V.—*Notes on other mining fields:*
Chapter XX.—Arizona.
XXI.—Utah.
XXII.—The Isthmus of Panama.
PART II.—The relations of government to mining: Introduction.
SECTION VI.—*Mining law.*
Chapter XXIII.—Mining and mining law among the ancients.
XXIV.—Mining law in the middle ages.
XXV.—The Spanish mining law.
XXVI.—Modern German codes.
XXVII.—The code of France.
XXVIII.—Mining law of Switzerland.
XXIX.—Mining law of England.
XXX.—Mining regulations of Australia.
XXXI.—Mining laws of Canada.
XXXII.—Conclusions.
SECTION VII.—*Mining Education:*
Chapter XXXIII.—Means of disseminating information with regard to mining and metallurgy; the National School of mines.
SECTION VII.—*Mining Education—Continued.*
Chapter XXXIV.—The Freiberg School of Mines.
XXXV.—The Paris School of Mines.
XXXVI.—The Prussian School of Mines.
XXXVII.—The School of Mines at Clausthal.
APPENDIX.—Statistics of bullion, ores, etc., at San Francisco, for the ear 1868.

EXTRA CLOTH, $1 75.

Address,
WESTERN & CO.,
No. 37 PARK ROW, New York.

PUBLICATIONS.

NOW READY.

Third Edition, Seventh Thousand, Revised, Enlarged, and Improved,

HOPTON'S CONVERSATIONS on MINES,

BETWEEN

FATHER AND SON,

ENLARGED FROM 112 TO 192 PAGES.

The Follcwing are the Contents:

Air, why it is propelled down, into and around the workings
" Quantity of, produced by the furnace.
" Friction of
" The great friction of produced by one mode of ventilation, and how reduced by another
" Pure added to impure (plans.
" Splitting of (plans)
" One current of (plans)
" One current of, and how to adopt separate currents (plan)
" Dividing of, but not into "separate and and distinct" current (plans)
" Crossings (see H on plans)
" Weight of in shafts
" How to find the weight of
" Table of pressure in shafts
" Expansion of
" Its velocity and force
" Rush of, into each division
" Quantity produced by natural ventilation
" Splitting, why it should be adopted
" Splitting, why the workmen object to Mr. Hopton adopting the mode
Anemometer, measurement of air by, engraving of
Area of a pit, how to find
Barometers. Showing the time of an outlet of gas in mines (engraving)
Bricks, how to find the number in the walling of a shaft.
Buddle's plan
Circumference of a pit, how to find
Coal, several ways of working it out, and why man methods of working it out are adopted
" Working out in banks (plans)
" Working it out in following up banks (plan)
" Working out in pillars (plans)
" Working out in long wall (plans)
" Working out in drifts (plans)
" Working out with no regularity (plan)
" Working out by the "end way" or in endings (plan)
Cubical Contents of a pit, how to find
Dialing, the mode of
Dials, several engravings
" How constructed
" How fixed in mine surveying
" Needle, its variations
Diameter of shaft
Dip of mine, how to find and lay on (plan)
Explosion, the power of an
" At Lund-hill, in what part of the mine it was supposed to take place (plan)
" How the power may be diminished
Furnace, how to find the horse-power of
" The place of fixing, to produce the largest ventilating current
" Engravings of ground floor, front and back view
" Remarks upon
Gases, (carbonic acid) composition of
" Do. properties of
" (After, or choke damp) composition of
" (Carburetted hydrogen) do.
" Choke damp and carbonic acid, not one and the same in qualitty
" The effect produced on people by inhaling such
" The quantity required for an explosive mixture
" The elasticity of
" The weight of
" The nature and quality of
" Why some mines generate and produce more than others
" Why some mines generate a mixture of
Goaf, or gob, how tramrods are made through (plan)
Lund-hill (plan)
Managers, who are best competent to manage mines
Miscellaneous questions
Natural ventilation
Planning, how workings are laid on the plan
Regulations (see R on plans)
Safety Lamps, why flame will not penetrate through, engraving of
Sections on mechanical ventilation
Summary of accidents
Surveying, how mines are with the dial
Surveying, how mines are with the theodolite
Tables of weights and measures
Temperature on surface
Temperature in mines
Temperature, difference of between down and up-cast
Theodolites for mine surveying
Theodolites, how constructed
Theodolites, the magnetic needle dispensed with, and how workings are laid on plan, with Theodolite surveying
Theodolites, how mines are surveyed with them
Up-cast larger than down-cast (plan)
Ventilating mines by mechanical power
Ventilation, several ways of
Weather, how a change of affects the workings
Workmen, capabilities of

Testimonials, Reviews, etc.

"Such a work, well understood by miners, would do more to prevent colliery accidents than an army of inspectors."—*Colliery Guardian.*

"The book cannot fail to be well received by all connected with collieries."—*Mining Journal.*

"Its contents are really valuable to the miners of this country."—*Miner's Conference.*

"I have works priced at £4 that do not contain the same information."—W. W. KENRICK, Colliery Viewer.

"The work is replete on the subject of underground management."—M. BARNES, Colliery Proprietor.

"I have had twenty years' management. It is the best work I ever read, and deserves to be circulated in every colliery district."—JOSEPH EAMES.

WESTERN & CO.,
Sole Agents for the United States.

For sale at the office of the ENGINEERING AND MINING JOURNAL, 37 Park Row, New York, and through any Bookseller. Price $1.

TO THE WORKING CLASS.—We are now prepared to furnish all classes with constant employment at home, the whole of the time or for the spare moments. Business new, light and profitable. Persons of either sex easily earn from 50c. to $5 per evening, and a proportional sum by devoting their whole time to the business. Boys and girls earn nearly as much as men. That all who see this notice may send their address, and test the business, we make this unparalleled offer: To such as are not well satisfied, we will send $1 to pay for the trouble of writing. Full particulars, a valuable sample, which will do to commence work on, and a copy of *The People's Literary Companion*—one of the largest and best family newspapers published—all sent free by mail. Reader, if you want permanent, profitable work, address, E. C. ALLEN & CO., Augusta, Maine. Jan18:3m

THE BALLARD FURNACE.

IMPROVED DESULPHURIZING PROCESS FOR CRUSHED ORES, SLIMES AND TAILINGS.

Parties wanting a CHEAP, SIMPLE and EFFICIENT method of ore reduction, and one specially adapted to low grade ores, slimes and tailings, will find it to their advantage to carefully investigate the merits of this process.

For full information apply to MOREY & SPERRY, 95 Liberty street, New York, or to F. W. CROSBY, North Barrier, North Carolina. Dec.21-3m

PUBLICATIONS.

PUBLICATIONS OF THE

AMERICAN INSTITUTE OF ARCHITECTS.

WESTERN & COMPANY

Having made arrangements with the Committee on Library and Publications of the above Association, are prepared to furnish the publications of the Institute to the trade and the public.

The Publications consist of the Proceedings of the Annual Conventions of the Institute, and Papers read before the Chapters of that body, as well as Papers contributed by Members of the Institute and published by its Committee on Library and Publications.

They are elegantly printed Pamphlets of large quarto size, with two columns to a page.

The Pamphlets thus far issued comprise the publications for two years past, and cover transactions of three years.

LIST OF PUBLICATIONS TO DATE.

I.

PROCEEDINGS OF THE ANNUAL CONVENTION OF THE

American Institute of Architects,

Held in New York, October 22d and 23d, 1867.

Comprising, Minutes of the Convention, The Annual Address by Richard Upjohn, President; Reports of the Trustees and Standing Committees, and the Closing Address.

32 Pages, Quarto.....Price, 30 cents.

II.

FIRE-PROOF FLOORS

FOR

Banks, Insurance Companies, Office Buildings, and Dwellings.

Tables Shewing the Distances from Centres at which Rolled Iron Beams should be Placed, and the Weight of Metal per superficial foot of the Floor,

BY R. G. HATFIELD, F. A. I. A.

8 Pages, Quarto.....Price, 30 cents

III.

Proceedings

OF THE

SECOND ANNUAL CONVENTION

Held in New York, December 8, 1868

Comprising the Minutes of the Convention, The President's Address by Richard Upjohn, Esq., and the Reports of Trustees and Standing Committees.

16 Pages, Quarto.....Price 40 cents

IV.

REMARKS

ON

FIRE-PROOF CONSTRUCTION;

A Paper read before the New York Chapter of the American Institute of Architects, April 8, 1869.

BY P. B. WIGHT, F. A. I. A.

8 Pages, Quarto.....Price, 30 cents.

V.

THE

Architectural and Other Art Societies of Europe;

SOME ACCOUNT OF THEIR

ORIGIN, PROCESSES OF FORMATION, AND METHODS OF ADMINISTRATION,

With suggestions as to some of the conditions necessary for the maximum success of a National American Architectural-Art Society, with its local dependencies.

BY A. J. BLOOR,

FELLOW OF THE AMERICAN INSTITUTE OF ARCHITECTS

Read before the New York Chapter A. I. A., February 16, 1869.

62 Pages, Quarto..... Price, $1

VI.

PROCEEDINGS OF THE THIRD ANNUAL CONVENTION, held in New York, Nov. 16 and 17th, 1869.

Comprising the Annual Address by Richard Upjohn, President; the Reports of Trustees, Standing Committees and Chapters; papers read by Adolph Chess, R. G. Hatfield, and Richard Upjohn; Debates on matters of Professional interest, and the closing address of Professional Guilds, by E. L. Godkin. 69 pages quarto. Price $1.

The above Pamphlets may be had singly, and will be sent by mail to any address on receipt of the price.

THE TRANSACTIONS BOUND.

The Publications of the Institute may also be had bound in cloth, making a handsome quarto volume of 126 pages, comprising the Transactions of the Institute for three years, ending November 16, 1869, the time of holding the Annual Convention for the present year. Price, $3.

WESTERN & COMPANY will also publish the papers to be read at the meetings of Chapters of the Institute, during the coming year in the ENGINEERING AND MINING JOURNAL, and abstracts in the MANUFACTURER AND BUILDER, which will be duly announced. Address

WESTERN & COMPANY
No. 37 PARK ROW, NEW YORK.

COAL SHIPPERS.

E. B. ELY & CO., SHIPPERS OF

COAL,

33 TRINITY BUILDING, 111 BROADWAY,

NEW YORK.

"Old Company's" Lehigh, J. H. Swoyer's Enterprise, Wyoming, Wilkesbarre, and Locust Mountain Bituminous Coal.

E. B. ELY,
S. W. ELY,

ap24-1y-q

POWELTON COAL AND IRON COMPANY, Sole Shippers of the Celebrated

Powelton Semi-Bituminous Gas

AND ANTHRACITE COALS,

104 Walnut street, Philadelphia.

BRANCH OFFICES:

New York, Trinity Building; 17 Doane street, Boston; Cleveland, O.; Pittsburgh, Pa. jan30-1s

SAMUEL BONNELL, JR., OFFERS FOR SALE his SUGAR CREEK and HONEY BROOK

LEHIGH COALS,

OFFICE:

43 and 45 TRINITY BUILDING, 111 BROADWAY, NEW YORK. Jan1:y

HONEY BROOK COAL COMPANY, Exclusive Miners and Shippers of the Celebrated

Honey Brook Lehigh Coal,

No. 111 BROADWAY, NEW YORK.

JAMES H. LYLES, Agent.

Wharves, Port Johnson, N. J. Philadelphia office, 209 Walnut street.

ap20-1y J. B. McCREARY, President.

WILKESBARRE COAL, DELIVERED DIRECT from the Mines of

The Wikesbarre Coal and Iron Co.,

or for re-shipment at

HOBOKEN AND JERSEY CITY.

OFFICE:

ap1-1y No. 80 Broadway, New York.

WHITE, FOWLER & SNOW.

Wilkesbarre and Lehigh Coal,

FOR STEAM AND FAMILY USE.

OFFICE:

Room No. 75, 111 BROADWAY, (Trinity Building).

jan1-1y JNO. WHITE, LINDLEY H. FOWLER, LOUIS T. SNOW.

THE NEWBURGH ORREL COAL COMPANY.

Mines at Newburgh, Preston Co., W. Va.
Company's Office, No. 52 S. Gay St. Baltimore, Md.

C. OLIVER O'DONNELL.....President.
G. W. MAHOOL.....Secretary.

This Company offer their very superior Gas Coal at lowest market prices.

It yields 10,996 cubic feet of gas to the ton of 2,240 lbs., of good illuminating power, and of remarkable purity; one bushel of lime purifying 6,792 cubic feet, with a large amount of coke of good quality.

It has been for many years very extensively used by various Gas Companies in the United States, and we beg to refer to the Manhattan, Metropolitan, and New York Gas Light Companies of New York, the Brooklyn and Citizens' Gas Light Companies of Brooklyn, N. Y., the Baltimore Gas Light Company of Baltimore, Md., and Providence Gas Light Company, Providence, R. I.

The best dry coals shipped, and the promptest attention given to orders. sep21-1y

COXE BRO.'S & CO., CROSS CREEK COLLIERY, Miners and Shippers of the Celebrated

Cross Creek Free Burning Lehigh Red Ash

COAL.

FROM THE BUCK MOUNTAIN VEIN.

OFFICES;

Philadelphia, No. 341 Walnut street.
Drifton, Jeddo P. O., Luzerne Co., Pa.

Agent in New York, SAMUEL BONNELL, Jr., Room 43, Trinity Building,

feb-1y 111 Broadway.

G. B. LINDERMAN & CO.,

MINERS,

Sugar Loaf, Lehigh Coal.

OFFICE, 50 TRINITY BUILDING, 111 BROADWAY, may23-1y NEW YORK.

DAVIDSON, YOUNG & CO.,

Wholesale Dealers in

LOCUST MOUNTAIN, SHAMOKIN, LEHIGH, CUMBERLAND, SCRANTON, AND WILKESBARRE

COALS.

ROOM NO. 16, TRINITY BUILDING, New York.

WM. M. DAVIDSON, (Formerly of Tyler & Co.) may1-1y
SAM'L B. YOUNG, (Formerly of Caldwell, Gordon & Co.)
ROB'T K. BUCKMAN

RANDOLPH BROTHERS, Sole Agents of the original

Spring Mountain Lehigh Coal,

Extensively used for Smelting Iron.

Rooms, 28 and 30 Trinity Building,

ap6tf NEW YORK.

CENTRAL COAL M. AND M. COMPANY,

15 AND 17 TRINITY BUILDING,

NO. 111 BROADWAY, NEW YORK.

MINERS AND SHIPPERS OF

George's Creek Cumberland Coal.

HENRY A. SMYTHE, President.
F. P. WHITE, Sec. and Treasurer.

Sept 28-1y

COAL SHIPPERS.

THE DESPARD COAL COMPANY OFFER their Superior DESPARD COAL to Gas Light Companies throughout the country.

MINES IN HARRISON COUNTY, West Virginia.
Wharves, Locust Point, Company's Office, No. 29 South st. } Baltimore.

AGENTS:

PARMELE BROTHERS, No. 32 Pine street, New York.
BANGS & HORTON, No. 31 Doane street, Boston.

Among the consumers of Despard Coal we name Manhattan Gas Light Co., New York; Metropolitan Gas Light Co., New York; Jersey City Gas Light Co., Jersey City, N. J.; Washington Gas Light Co., Washington, D. C. Portland Gas Light Co., Portland, Maine.

☞ Reference to them is requested. may30-1y

LEWIS AUDENRIED & CO., MINERS AND Shippers of the following celebrated ANTHRACITE COALS,

From Philadelphia and the Mines,

DIAMOND, Red Ash; SPOHN, Red Ash; ORCHARD, Pink Ash; BROAD MOUNTAIN, White Ash; LOCUST MOUNTAIN, White Ash; BLACK HEATH, White Ash; Old Company's Lehigh; Wilkesbarre.

From Port Johnston and Jersey City,

Old Co.'s Lehigh, Hazleton, Wilkesbarre, and Shenandoah Coals.

Also the superior CUMBERLAND COALS.

BROAD TOP, SEMI-BITUMINOUS, at Philadelphia.
BARTON, GEORGES CREEK, at Baltimore.
BARTON, GEORGES CREEK, at Alexrndria.

205 Walnut street, Philadelphia; 14 Kilby street, Boston 34 Westminster st., Providence; 24 Second st., Baltimore 110 BROADWAY, NEW YORK. Jau13.y

W. D. CRANE & CO.,

SHIPPERS OF

Anthracite and Bituminous Coal,

For Iron and Steam purposes.

NEW YORK: 115 Broadway. | BOSTON: 26 Kilby Street.

apr10tf

VAN WICKLE & STOUT, Miners and Shippers of

Fulton & Stout Lehigh Coals.

☞ OFFICE, 119 BROADWAY, ROOM 18, NEW YORK. ☜

Our Fulton Lump is a superior article for FOUNDRY USE. feb20-1y

ENGINEERS.

P. H. VAN DER WEYDE, M. D.,

(Late Professor of the N. Y. Medical College, of Mechanics, etc., at the Cooper Institute, and of Industrial Science at the Girard College, Philadelphia.)

Analytical & Consulting Chemist and Engineer.

RESIDENCE, 73 Seventh Street.

Office ENGINEERING AND MINING JOURNAL, 37 Park Row, New York City. jan30tf

R. P. ROTHWELL,

MINING AND CIVIL ENGINEER AND METALLURGIST,

From the Imperial School of Mines, Paris, member of the Geological Society of France, etc,

OFFICE, WILKESBARRE, PA.

Having had a large practical experience in Europe and this country, is prepared to examine and report on all kinds of mineral property, superintend mines, and metallurgical works, assay ores, etc. 18-2-qp

HAWKINS, HERTHEL & BURRAL,

Civil and Mechanical Engineers,

BUILDERS OF

Herthel's Patent Truss, and other Iron Bridges, Roofs, and Turn-Tables. Also Howe's Patent Truss, and other Timber Bridges, Roofs, and Turn-Tables.

Corrugated Iron Doors, Shutters, and Iron Building Material generally. Contractors for Piling, Docking, and General Railroad Work.

July 20-1y SPRINGFIELD, MASS.

A. D. BRIGGS & CO.,

Civil and Mechanical Engineers,

BUILDERS OF

Tucsdell's Patent Truss Bridge, and other Iron Bridges, Roofs, and Turn-Tables. Also Howe's Patent Truss Bridge and Roof, and other Timber Bridges and Turn-Tables. Particular attention given to repairing all kinds of Bridges. All work warranted to give satisfaction. Plans, Estimates, and Specifications, upon application.

July 20-1y SPRINGFIELD, MASS.

ADOLPH MEZGER, MINING AND METALLURGICAL ENGINEER, for many years engaged in the practical management of mines and furnaces in Saxony, Russia, Austria, Mexico, etc., and thoroughly acquainted with the mining of Coal, Copper, Iron, Lead, etc., is prepared to give assistance and information in all branches of the profession, or would accept an engagement in a mining or smelting establishment. The highest references furnished. Address the office of the ENGINEERING AND MINING JOURNAL, 37 Park Row New York. jan 11-tf

THEODORE ALLEN,

ENGINEER,

No. 45 William street, New York.

Designs and Specifications prepared for all kinds of Iron Ships and Steam Machinery. Construction and Repairs superintended. Experiments conducted. Advice given, etc. All kinds of Machinery furnished at Manufacturers' prices. feb8-tf

WILLIAM E. GUY,

after a three years' course at the Academy of Mines in Freiberg, Saxony, seeks a position as

MINING ENGINEER OR METALLURGIST.

Intends to make a trip to Colorado, Nevada and California in the Spring and Summer, and is prepared to make reports on mines and claims. Address, No. 68 Wes. Third street, Cincinnati, Ohio. feb8-4t

JULIEN THOULET, GRADUATE OF THE University of Paris, Member of the Society of Engineers of France, employed for several years in Spain, Italy, and America, as Chief and Mining Engineer, would accept an engagement in a mining or smelting establishment. The highest references furnished. Address, by letter, No. 3 William street, New York. Feb. 15:tf

BENJAMIN SMITH LYMAN,

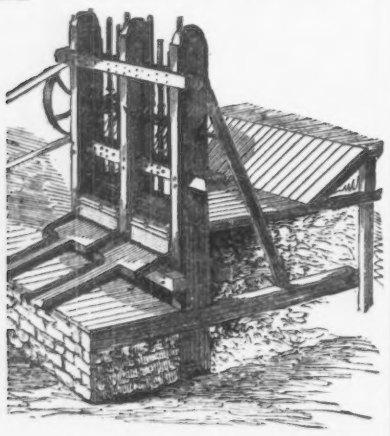
MINING ENGINEER,

GEOLOGIST AND TOPOGRAPHER,

No. 135 South Fifth Street, Philadelphia,

MINING MACHINERY, ETC.

MINING MACHINERY OF ALL KINDS.



CALIFORNIA STAMP MILLS,

WITH IRON OR WCOD FRAMES.

Rock Breakers, Excelsior Grinders, Amalgamators, Pans, Separators, Wet & Dry Concentrators, Mining Supplies, Wheeler & Randall's Quartz Reducing Amalgamating & Concentrating Machinery, Engines, Boilers and Fixtures. All kinds of Pans and Amalgamators, and Quartz Mills for reducing Gold and Silver Ores, the same as built in San Francisco, California, and at lower prices.

We are now building the

HOWLAND PATENT ROTARY BATTERY

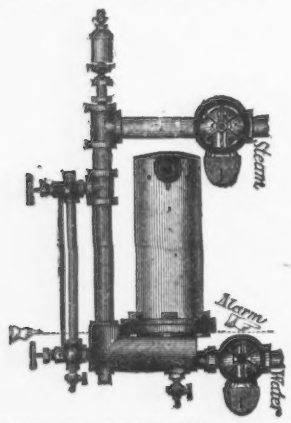
of 12 stamps. It requires no wood frame to put it up. Guaranteed to crush 2½ to 3 tons per day to the stamp. The best Battery ever used for amalgamating gold, or crushing silver ores, dry or wet. Can be put up on a mine in running order for one-half the price of the straight battery, and in three days after its arrival at the mine. Weight complete, ready for the belt. 18,000 pounds. Cost, $3,000 currency, for 12-stamp battery.

☞ Send for a Circular.

Address

MOREY & SPERRY,
Jan 10:y 95 Liberty Street New-York.

NEYNABER'S MONITOR LOW-WATER INDICATOR FOR STEAM BOILERS.



SIMPLICITY, PRECISION OF ACTION AND DURABILITY.

This Indicator has no equal. It it superior to any Low-Water Indicator in use. In use at the U. S. Mint, Phila.; Treasury Department and Agricultural Department, Washington, and Post Office Philadelphia, and many others. A. F. W. NEYNABER, Gen. Agent,
425 Girard avenue, near Fourth st., Philadelphia, Pa.
nov. 16:1y

B. KREISCHER,

NEW YORK FIRE BRICK AND
STATEN ISLAND

Clay Retort Works.

Established 1845.

Office, 58 Goerck Street, Corner Delancy Street, East River, New York. mar28-1y-q

INSTRUCTION.

SCHOOL OF MINES, COLUMBIA COLLEGE.

FACULTY.—F. A. P. BARNARD, S.T.D., LL.D., PRESIDENT; T. EGLESTON, JR., E. M., Mineralogy and Metallurgy; C. F. CHANDLER, PH. D., Analytical and Applied Chemistry; JOHN TORREY, M.D., LL.D., Botany; C. A. JOY, PH. D., General Chemistry; W. G. PECK, LL.D., Mechanics; J. H. VAN AMRINGE, A.M., Mathematics; O. N. ROOD, A.M., Physics; J. S. NEWBERRY, M.D., LL.D., Geology and Paleontology. Regular courses for Mining Engineering; Metallurgy; Geology and Natural History; Analytical and Applied Chemistry. Special students received for any of the branches taught. Particular attention paid to Assaying. For further information and catalogues, apply to

DR. C. F. CHANDLER,
nov21-1y-is Dean of the Faculty.

RENSSELAER POLYTECHNIC INSTITUTE, Troy, N. Y., a School of

ENGINEERING AND PRACTICAL SCIENCE.
Founded, 1824.

The courses of instruction, each extending over four years, are

1. CIVIL ENGINEERING.
2. MINING ENGINEERING.
3. MECHANICAL ENGINEERING.
4. NATURAL SCIENCE.

Degrees conferred in the different departments.

Applicants for admission must not be less than 16 years of age.

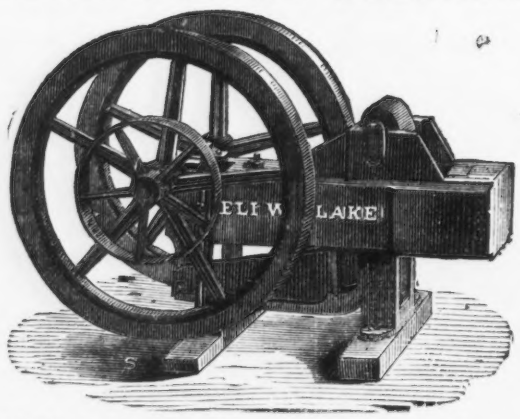
The course in Geodesy includes extensive engineering field practice. The proximity of iron, steel, and machine works, together with railroads, canals, and bridges affords great facility for thorough practical instruction. Laboratory privileges unsurpassed. Special courses in Assaying.

For Annual Register giving full particulars apply to

Prof. CHARLES DROWNE, Director.

MINING MACHINERY.

BLAKE'S STONE BREAKER.



The office of this Machine is to break Ores and Minerals of every kind into small fragments, preparatory to their further comminution by other machinery.

This machine has now been in use, enduring the severest tests, for the last ten years, during which time it has been introduced into almost every country on the globe, and is everywhere received with great and increasing favor as a labor-saving machine of the first order.

Illustrated circulars, fully describing the machine, with ample testimonials to its efficiency and utility, will be furnished on application, by letter to the undersigned.

☞ The Patents obtained for this machine in the United States and in England having been fully sustained by the courts, after well contested suits in both countries, all persons are hereby cautioned not to violate them; and they are informed that every machine now in use or offered for sale, not made by us, in which the ores are crushed between upright convergent faces or jaws actuated by a revolving shaft and fly-wheel, are made and used in violation of our patent.

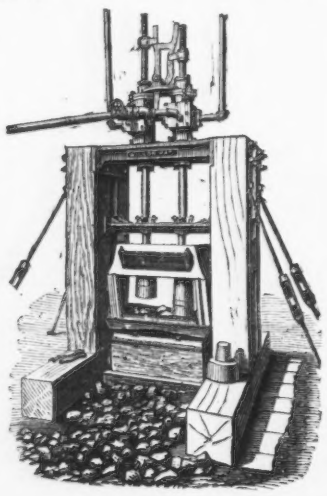
Mch. 14-1y. **BLAKE BROTHERS, New Haven, Conn.**

THE WILSON PATENT

Steam Stamp-Mill Company,

OF PHILADELPHIA, PA.

Are now prepared to supply Miners and other parties with their

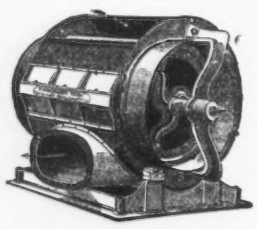


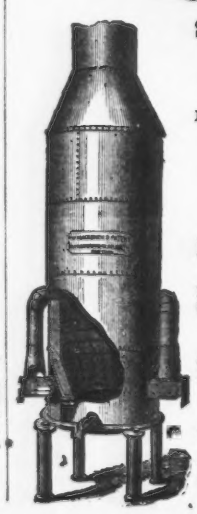
New Steam Stamp-Mills

AT THE SHORTEST NOTICE.

These Mills have now been in operation for upwards of a year, and have proved to be the most durable and efficient, as well as the lightest for transportation, of any mills now used. The valve gear is of the simplest and most durable construction, readily adjustable by movable cams on the piston rods or stamp stems, thereby giving the operator absolute control of the length and velocity of motion and force of the blow. These Mills are adapted for both dry and wet crushing, and for the hardest rock or softest cement. These Mills are every way equivalent to a Twenty Stamp Mill. For further particulars call on or address

THE WILSON PATENT STEAM STAMP-MILL COMPANY,
Aug31-1y 326 Walnut street, Philadelphia.





SMITH & SAYRE

MANUFACTURING CO.,

PROPRIETORS AND

MANUFACTURERS

OF THE

Mackensie Pa

BLOWER and CUPOLA and SMELTING FURNACE.

Also, Mackensie's Patent GAS EXHAUSTER and COMPENSATOR. Address

SMITH & SAYRE

MANUFACTURING COMPANY,

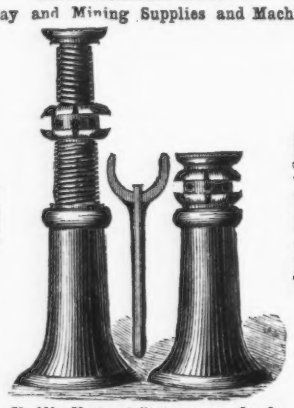
95 Liberty street, N. Y. Send for illustrated phamphlet.
Mar26-1y

ALBERT BRIDGES,

MANUFACTURER AND DEALER IN

Railway and Mining Supplies and Machinery.

Bolt and Cold Punched Nuts, Bolts, Lag Screws and Washers.



Belting, Packing, Hose, Rubber Springs, Car Trimmings, Steam Pumps.

Ball's Patent Telescope Jack.

NO. 46 CORTLANDT STREET,
P. O. Box, 2813. NEW YORK.
Aug 31-1y

KROM'S DRY ORE CONCENTRATOR.

Concentration by means of Air

has long been attempted, but hitherto without satisfactory results. **S. R. Krom** has invented and patented machines which concentrate the various ores more perfectly than can be done by any other means.

The *MECHANICAL COMBINATIONS* are extremely simple, the machines therefore correspondingly durable. A continuous self-delivery of ore on one side and tailings on the other is effected, hence very little attention is required except keeping the hopper supplied with ore. The power of one man is sufficient to operate a machine that will concentrate one ton per hour.

PARTIES INTERESTED IN MINING are invited to call at No. 210 Eldridge Street, New York, where they may see a machine in operation, and have samples of their own ores crushed and concentrated.

Illustrated Circulars may be had on application to

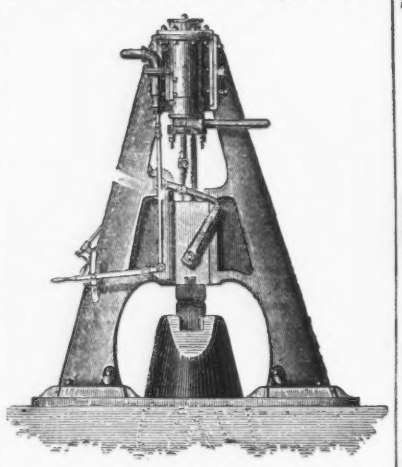
STEPHEN R. KROM,
jan10 1y-is No. 210 Eldridge Street, N. Y.

IRON WORKS.

WM. A. SWEET & CO., NO. 33 WYOMING STREET, SYRACUSE, N. Y.,

MANUFACTURERS OF

STEAM-HAMMERS,



ELLIPTIC SPRINGS, CAST-STEEL CROWBARS.

Sweet's Celebrated Steel Tire, and Cast-Steel Sleigh and Cutter Shoes. nov. 16:6m

STEAM PUMPS.

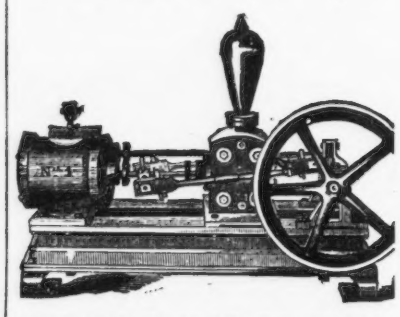
THE WOODWARD

Steam Pump Manufacturing Company.

MANUFACTURERS OF THE

WOODWARD PATENT IMPROVED SAFETY

Steam Pump and Fire Engine.



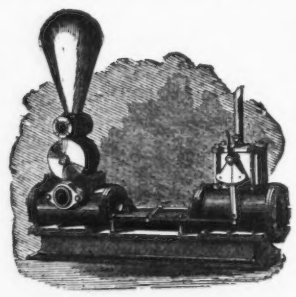
STEAM, WATER, AND GAS FITTINGS OF ALL KINDS.

Also dealers in WROUGHT IRON PIPE, BOILER TUBES, etc. Hotels, Churches, Factories, and Public Buildings, heated by Steam, Low Pressure.

Woodward Building, 76 and 78 Centre street, corner Worth street, New York. Formerly 77 Beekman street.
mar 14-1y GEORGE M. WOODWARD, Pres't.

Niagara Steam Pump Works.

FIRST PREMIUM



AMERICAN INSTITUTE, 1867.

CHARLES B. HARDICK,

9 ADAMS STREET, BROOKLYN, N. Y.

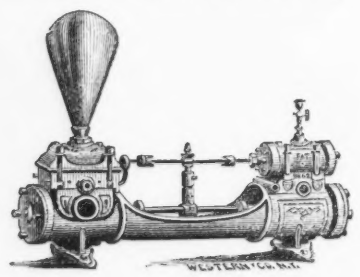
Sole Manufacturer of

HARDICK'S PATENT DOUBLE-ACTING

Steam Pump and Fire Engine.

Patented in England, Belgium and France. Send for circular. feb-13-1y

Knowles' Patent Steam Pump.



FACTORIES AT WARREN, MASS.

WAREHOUSE, NO. 126 LIBERTY STREET, NEW YORK.

Air Pumps, Blowing Engines, Hydraulic Pressure Pumps, New Locomotive Pumps, Fire Pumps, Boiler, Feed, Marine, Drainage, Sugar-work, Brewery, Distillery, Oil and Wrecking Pumps.

Improved Horizontal and Vertical

MINING PUMPS

(Working with Plungers, and especially arranged for pumping water containing dirty or gritty matter.)

Pumps for every possible duty, and all fully guaranteed. Also,

KNOWLES' PATENT SAFETY BOILER FEEDER

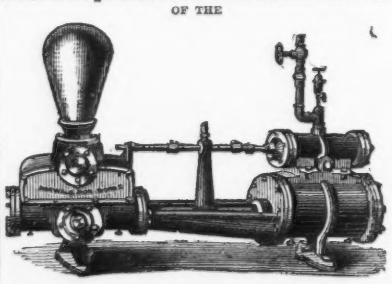
Send for Illustrated Circular. 10-1yjuly

NORWALK IRON WORKS,

SOUTH NORWALK, CONN.,

Sole Proprietors and Manufacturers

OF THE



Earle Steam Pump and Fire Engine,

(Patented in the United States, France, England and Belgium.)

Air and Vacuum Pumps,

STEAM AND BLOWING ENGINES,

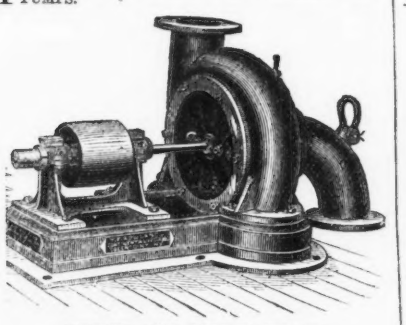
Pumping Engines for Water Works, Horizontal and Tumbling Beam Engines, Mining, Wrecking, and Supply Pumps.

IRON AND BRASS CASTINGS, of every description.

☞ Send for illustrated Catalogue. mch13-1y-is

STEAM PUMPS.

IMPROVED MINING AND WRECKING PUMPS.



LEBBY AND DUC PATENTS.

MANUFACTURED SOLELY BY

T. F. ROWLAND, CONTINENTAL WORKS,

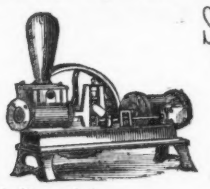
Greenpoint, Brooklyn, N. Y.

New York Office, No. 64 Broadway, Room 33.

☞ Send for Illustrated Circular. july16-1y-is

J. CLAYTON'S

Patent Fly Wheel and Direct Action



STEAM PUMPS,

HAND PUMP AND STEAM ENGINE COMBINED.

These pumps are the cheapest first-class pumps in the market.

All sizes made to order at short notice.

JAMES CLAYTON, 24 & 26 Water st.,

Nov18-tf Brooklyn, N. Y.

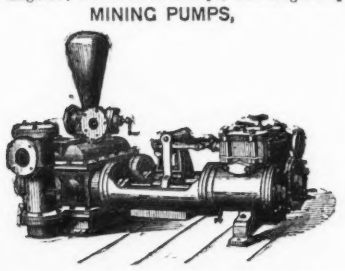
HYDRAULIC WORKS.

MANUFACTORY,

BROOKLYN, N. Y.

Steam Pumping Engines, Single and Duplex, Worthington's Patent, for all purposes, such as Water Works Engines, Condensing or Non-condensing; Air and Circulating Pumps, for Marine Engines; Blowing Engines; Vacuum Pumps, Stationary and Portable Steam Fire Engines; Boiler Feed Pumps, Wrecking Pumps,

MINING PUMPS,



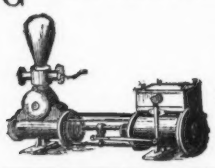
Water Meters, Oil Meters; Water Pressure Engines; Stamp Mills for Gold, Silver and Copper Ore; Eaton's Patent Amalgamators for Gold and Silver; Steam and Gas Pipe, Valves, Fittings, etc. Iron and Brass Castings.

☞ Send for Circular.

H. R. WORTHINGTON,

feb1-1y 61 Beekman street, New York.

GUILD & GARRISON, MANUFACTURERS OF



Steam Pumps, Vacuum Pumps, Steam Engines, Vacuum Pans,

And all the various connections. For sale at the STEAM PUMP WORKS, 26, 28 and 30 First street, Williamsburgh, N. Y.

sp14-6m

"THE MANUFACTURER AND BUILDER."

A Practical Journal of Industrial Progress.

PUBLISHED MONTHLY.

NOW IN IT'S SECOND YEAR.

Every Manufacturer and Builder should have it. Every Ope ative and Mechanic should have it. Every Architect and Mason should have it. Every Pa nter and Plumber should have it. Every Carpenter and Blacksmith should have it. Every counting room and Library should have it. Price within the reach of all.

SUBSCRIPTION ONLY $1 00 PER YEAR.

32 Large Quarto Pages for 15 cents.

344 Large Quarto Pages for $1 50.

Filled with Valuable Reading Matter.

IT COSTS LESS THAN THREE CENTS PER WEEK!!

A single hint in this p per may be worth hundreds of dollars, or prove a fortune to many.

"The Manufacturer and Builder"

Is splendidly illustrated with engravings of everything new relating to manufacturing and building.

GET YOUR CLUBS TOGETHER.

PREMIUMS.

We are induced to offer the following CASH PREMIUMS to those who will work to get up these clubs! $5 00, $10 00, $15 00 $20 00 made in as many minutes! READ! READ! READ!

On every club of	4	names, at	$1 50	each,	$1 00	cash.
"	"	"	10	"	1 50	"	3 00	"
"	"	"	15	"	1 50	"	6 00	"
"	"	"	20	"	1 00	"	10 00	"

Including 20, and for every additional name obtained above that number, 50 cents each.

Where from ten to five hundred men congregate daily, there is no difficulty in r ising these clubs. If the money be forwarded to us with a list of names, the amount of premium may be deducted from the same.

Push the good work, and make glad the hearts of your fellow-workmen.

CLUBS IN VILLAGES AND TOWNS may be procured by any enterprising man or woman. Send for Specimen Copy, Circulars, Instructions, etc., Free. Take them and go among your friends and neighbors. In a half day you will often accomplish the task, and 5 10, or 15 Dollars will be earned together with the satisfaction of knowing that you have benefited your fellowmen. Address your orders plainly:

WESTERN & COMPANY, Publishers,

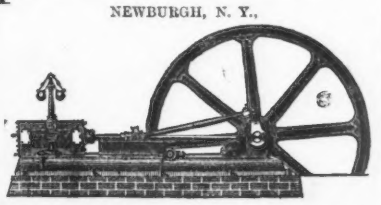
P. O. Box, 5969. 37 Park Row, New York.

☞ For sale by all newsdealers.

ENGINEERS' SUPPLIES.

THE WASHINGTON IRON WORKS,

NEWBURGH, N. Y.,



PREMIUM STEAM ENGINE,

WITH

WRIGHT'S PATENT CUT-OFF BY THE GOVERNOR.

MARINE ENGINES AND BOILERS of all descriptions, HIGH AND LOW PRESSURE;

PUMPING ENGINES.

for WATER WORKS, warranted to give the LARGEST DUTY with the smallest consumption of fuel.

SUGAR-CANE MILLS.

with suitable Steam Engines, Boilers, and attendant Machinery, Vacuum Pans, Coolers, Tanks, and Refining Machinery.

Manufacturers of

ATWOOD'S PATENT

SAFETY ELEVATORS AND HOISTING MACHINES.

Plain and Ornamental

IRON WORK FOR BUILDINGS,

WROUGHT AND CAST-IRON BRIDGES.

ALSO,

GEARING, SHAFTING, IRON AND BRASS CASTINGS.

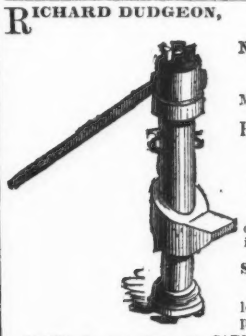
Address WASHINGTON IRON WORKS, NEWBURGH, N. Y.

☞ New York Office, No. 57 LIBERTY STREET.

sep7-6m.

MACHINISTS' SUPPLIES.

RICHARD DUDGEON,



No. 24 Columbia st.,

NEW YORK,

Maker and Patentee of

Hydraulic Jacks

AND

Punches,

Roller Tube Expanders, and Direct Acting

Steam Hammers.

Communications by letter will receive prompt attention.

JACKS for pressing on CARWHEELS or CRANK PINS made to order. May22:1y

---

THE NOVELTY IRON-WORKS.

(Foot of East Twelfth street.)

BRANCH OFFICE, Nos. 77 AND 83 LIBERTY STREET,

Manufacture

ACHITECTURAL IRON-WORK

OF ALL KINDS.

feb 1-1y

SAWS AND PLANERS.

CIRCULAR SAWS WITH EMERSON'S PATENT MOVEABLE TEETH.

These Saws are meeting with unprecedented success and their great superiority over every other kind, both as to efficiency and economy, is now fully established

Also,

EMERSON'S PATENT PERFORATED CIRCULAR AND LONG SAWS,

(All Gumming avoided,) and

EMERSON'S PATENT ADJUSTABLE SWAGE,

for Spreading, Sharpening, and Shaping the teeth of all Saws. Price, $5. Manufactured by the

AMERICAN SAW COMPANY

Office No. 2 Jacob St., near Ferry St., New York.
Factory, Trenton, N. J. Branch Office for Pacific Coast, No. 606 Front St., San Francisco, Cal.
Send for new Descriptive Pamphlet and Price List.

july1-1y

RICHARDSON, MERIAM & CO., Manufacturers of the latest Improved Patent.

DANIELS' & WOODWORTH PLANING MACHINES MATCHING, SASH AND MOULDING, TENONING, MORTISING, BORING, SHAPING, VERTICAL AND CIRCULAR RESAWING MACHINES.

Saw Mills, Saw Arbors, Scroll Saws; Railway, Cut-Off, and Rip-Saw Machines; Spoke and Wood Turning Lathes, and various other kinds of Wood-working Machinery.

Catalogues and Price Lists sent on application.
Manufactory, Worcester, Mass.
Warehouse, 107 Liberty Street, New York.

apr24-1y-q

MACHINISTS' SUPPLIES.

ANDREWS'

PATENT

Engines, Boilers, Pumps, Hoisters,

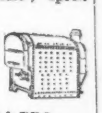
OSCILLATING ENGINES, run at great speed. Sizes 1-2 to 250 Horse-Power.

SMOKE-BURNING AND SUPER-HEATING BOILERS are economical and Safe.

CENTRIFUGAL PUMPS, pass Sand, Coal, Corn, Gravel, etc., without injury. Capacity 90 to 40,000 gallons per minute.

HOISTING MACHINES, run without noise; speed changed or reversed instantaneously.

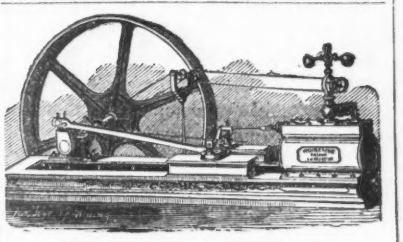
ALL COMPACT, LIGHT, AND DURABLE.



Address Manufacturers

WM. D. ANDREWS & BRO.,

july 1 1-y 414 Water street, New York.



TODD & RAFFERTY,

GENERAL

MACHINERY MERCHANTS, ENGINEERS, AND MACHINISTS,

Manufacturers of Stationary and Portable Steam Engines and Boilers; also Flax, Hemp, Tow, Oakum, and

ROPE MACHINERY,

MILL GEARING,

SHAFTING.

Lathes, Planers, Drills, Chucks, etc. Iron and Brass Castings. Judson & Snow's Patent Governors constantly on hand.

OFFICE AND WAREROOMS, NO. 10 BARCLAY STREET, N. Y.

Office and Works, Paterson, New Jersey.

JOSEPH C. TODD. oct-27-tf. PHILIP RAFFERTY.

NAHUM PERRY & CO.,

MANUFACTURERS OF

BOILERS, PIPE, FITTINGS, VALVES, COCKS, STEAM PUMPS, &c.

STEAM and GAS PIPING

IN ALL ITS BRANCHES.

PROVIDENCE, R. I.

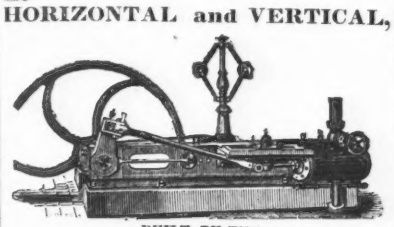
Public Buildings, Stores and Dwellings heated with High or Low Pressure Steam Apparatus.

Sept 24:3m e o w

ENGINES, IRON WORK, ETC.

RIDER'S PATENT CUT-OFF ENGINES,

HORIZONTAL and VERTICAL,



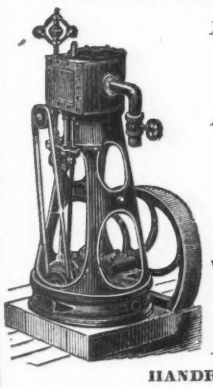
BUILT BY THE

DELAMATER IRON WORKS,

Foot of West Thirteenth Street,

NEW YORK CITY.

AND BY THE



Albany St. Iron Works,

Corner of

Washington and Albany Streets,

NEW YORK CITY.

HANDREN & RIPLEY,

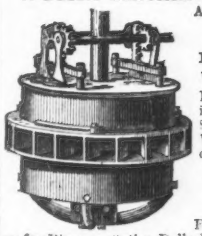
Proprietors.

Also, BOILERS, TANKS, and CASTINGS, of all descriptions. nov 2:1y

---

HUNT, WAITE & FLINT,

Woolen Machine Manufacturers,



And Manufacturers of Upright and Circular Saw Mills,

BREAST AND TURBINE

WATER WHEELS,

Regulators, Elevators, Shafting, Gearing, Pulleys, Gate Screws for Hoisting Gates, Woodworth's Planing Machines, Grist Mills, etc., etc.

Patent Rotary Fulling Mills.

Hammer Falling Stocks, Fulling Mills, Dusters, Washer for Rinsing Cloths, Dolly Washers for Hosiery Goods, Wool Washers for Washing Wool, Gigs, Dye Tubs, Blue Vats, and Steam Boxes.

Also Iron Founders. Every description of Casting furnished at short notice. All Machines and Castings furnished at this establishment warranted.

june6-tf-q ORANGE, MASS.

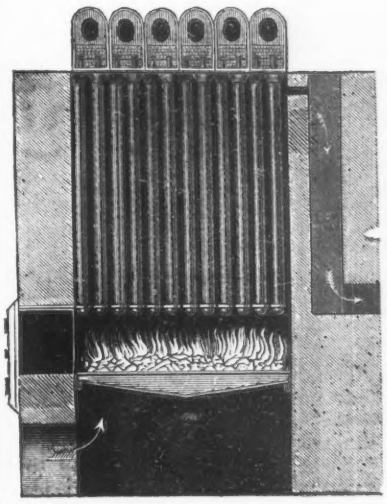
STEAM BOILERS.

THE STEAM GENERATOR

Manufacturing Company of Penn

This Company is now prepared to furnish

WIEGAND'S



Patent Improved Steam Generator,

Of any power required, upon two weeks' notice. They have been introduced in this city and thoroughly tested, with most satisfactory results, and are sold under Guarantee of Absolute

Safety from Destructive Explosion.

They are cheaper in first cost and in expense of erection, more economical in fuel, durable and convenient in use, than any other apparatus for generating steam. For Mining purposes it is unequalled, owing to the facility with which it can be transported and erected.

Office of the Company, 34 North Fifth Street,

Philadelphia, Pa.

Directors—NELSON J. NICKERSON, WALTER J. BUDD EMMOR WEAVER.

NELSON J. NICKERSON, President.

EDWARD H. GRAHAM, Sec. and Treas. sep14-1y

WORCESTER STEAM BOILER WORKS, manufacturers of

LOCOMOTIVE, FLUE AND TUBULAR BOILERS, OIL AND WATER TANKS, GASOMETERS, Etc.

WORCESTER, MASS.

N. B.—Boilers inspected and repaired in the best manner and at short notice.

CHAS. STEWART, Sup't.

may15-tf D. M. DILLON, Treas.

1870.

"THE ENGINEERING AND MINING JOURNAL,"

AN ILLUSTRATED WEEKLY PERIODICAL,

Intended to advance the interests of those engaged in ENGINEERING AND MINING, in the widest sense of those terms.

VOLUME IX. COMMENCED JAN 4.

ENGINEERING.

It contains matter of the highest importance to all who are engaged in

CIVIL ENGINEERING, as in the erection of buildings, the construction of industrial works, public and private, the surveying and laying out of roads, canals, railroads, etc., and the erection of bridges, docks, etc. Being the recognized official organ of the American Institute of Architects, the various papers on subjects connected with building, which are from time to time read before the Institute, will be published in its columns.

MECHANICAL ENGINEERING, as steam engines, hydraulic motors, the construction of tools, machinery, mill-work, etc.

AGRICULTURAL ENGINEERING, as the application of machinery to agricultural processes, and the improvement of agricultural districts by drainage, and various other operations involving an acquaintance with engineering practices.

HYDRAULIC ENGINEERING, as in the planning and construction of water-works, and the improvement of rivers, harbors, etc.

MINING is a subject that receives equal attention with Engineering. The various interests involved in the mining operations of the country, as

THE COAL TRADE,

THE METAL TRADE,

and MARKET REPORTS,

wherever they affect these subjects, are fully cared for, while the principles which relate to mining, geology, mineralogy, chemistry, and metallurgy are carefully elaborated, and all new discoveries relating there promptly detailed. In the practical departments relating to the working and management of mines, whether of gold, silver, copper, lead, iron, coal, slate, marble, stone, oil, salt, etc., will be found, not only the latest news, but a full discussion of the best methods of developing these important interests and bringing their products into marketable shape.

The ENGINEERING AND MINING JOURNAL is not strictly a new periodical, as for nearly four years it has occupied a prominent position in the field of journalism under the title, THE AMERICAN JOURNAL OF MINING, which is now presented re-modeled, improved, and in a new and more attractive form.

CONTRIBUTORS.

Among its Contributors will be found some of the ablest men of the day, and no effort or expense will be spared to make the information conveyed, FRESH, TRUSTWORTHY, AND THOROUGH.

ILLUSTRATIONS.

Subjects requiring the aid of engravings will be fully illustrated by cuts prepared by the best artists. Great pains will be taken in this department.

SUBSCRIPTION.

Subscription price $4 per annum, in advance. Any person sending us the names of four subscribers, with the full subscription rate, $16, will receive an extra copy free.

SINGLE COPIES, TEN CENTS EACH.

☞ Specimen Copies sent free on application to the Publishers. Address:

WESTERN & COMPANY,

P. O. Box 5969. 37 Park Row, New York.

News Dealers supplied by the *American News Company*, 121 Nassau St., New York.

1870. 1870.

PROSPECTUS OF

"The Manufacturer and Builder,"

A

PRACTICAL JOURNAL OF INDUSTRIAL PROGRESS.

This Journal has now been before the public for one year, and has won golden opinions from all who have examined it. Prior to its rise, the manufacturing and building interests of the United States were without any direct and adequate representation on the part of the public press. In magnitude and importance, they are second to no others on the continent. In publishing "THE MANUFACTURER AND BUILDER," it has been the aim of the proprietors to give to these interests a full, able and trustworthy representation—to supply, in fact, a want long existing among those engaged in industrial pursuits. As the cause of manufacturing and building is emphatically the cause of SKILLED LABOR, in working for the best interests of the former, the publishers have also advanced those of the latter.

"THE MANUFACTURER AND BUILDER"

Will therefore be as it has always been, a PRACTICAL Journal, appealing directly to the masses, either engaged or interested in the subjects of which it treats. While it is built up upon a truly scientific basis, the superstructure itself is eminently popular, coming within the easy grasp of every intelligent mind.

Party politics find no place in its columns, although, of course, questions of political economy, in so far as they bear upon the manufacturing and building interests, can not be ignored.

Like its predecessor, the volume for 1870 will contain a large proportion of original matter, prepared by the ablest writers of the day, in which important industrial questions will be carefully considered. It will contain, among others, elaborate articles upon the following subjects, namely:

The Different Kinds of Manufacturing Machinery;

The Manufacture of all Kinds of Materials, either Useful or Ornamental, that enter into the Structure of Buildings;

The Stone, Slate, and Marble Interests; Our Extensive Iron and Lumber Interests;

The Stability of the Various Kinds of Structures; The more Common as well as the Higher Forms of Architecture; Lime, Mortars, Cements, etc.; Ventilation, Sewage, and Kindred Subjects;

Discussions regarding the Character, Strength and Relative Value of Building Materials;

HOMES FOR THE MILLION,

INCLUDING PLANS, DETAILS OF CONSTRUCTION, ETC.

Whenever these articles admit of illustration, no expense will be spared in getting up engravings, executed in the very best manner. Each of the numbers issued during the year 1869, contained from twenty to twenty-five engravings, and the volume for 1870 will be illustrated with equal profusion.

It will also contain Notes on NEW DISCOVERIES and IMPROVEMENTS, REVIEWS of NEW PUBLICATIONS; SUMMARY of GENERAL PROGRESS in MANUFACTURING and BUILDING, both at home and abroad; SELECTIONS from the best English, French and German Periodicals; CORRESPONDENCE from the chief Manufacturing centres of Europe and America, keeping our readers well informed in regard to such industrial movements abroad as may have significance in reference to the progress of skilled labor at home; a HOME DEPARTMENT, in which will appear entertaining and instructive descriptions, explanations, etc., especially such as illustrate the applications of science to domestic life.

In a word, it is the intention of the publishers to make the paper, in every sense of the term, what is implied in its name.

It will be printed from new type, upon the best quality of paper, and will contain THIRTY-TWO LARGE QUARTO PAGES of interesting matter, closely printed and neatly put together. The rate of subscription will be continued as heretofore at ***only $1.50 per year.*** It is hoped that this low rate, combined with the merits of "THE MANUFACTURER AND BUILDER," will secure for it success, a wide circulation, and make it welcome in every office, manufactory, workshop, and dwelling of the industrial classes of the community.

Address, **WESTERN & COMPANY, PUBLISHERS,**

37 Park Row, New York.

"THE MANUFACTURER & BUILDER,"

ITS GREAT SUCCESS! WHY PEOPLE SUBSCRIBE TO IT!

CONTENTS FOR ITS FIRST SIX MONTHS.

Show it to your Friends.

THE success which has attended our efforts to provide a first-class Monthly, devoted to the interests of the industrial classes, has far exceeded our most sanguine anticipations. THE MANUFACTURER AND BUILDER has been received with favor by every class of the community. Manufacturers have taken it for the information which it gives in regard to the improved processes in which they are interested; mechanics have taken it for the instruction which it conveys in regard to matters pertaining to special arts and trades; professional and literary men have taken it for the information which it conveys in regard to the progress of the industrial arts; people, in general, have taken it because it contains much pleasant reading matter for the family circle. That all these classes have been right in their estimate of this journal, will be evident to any one who will read the Table of Contents which we here append. When we state that these articles are almost all derived from original and authoritative sources, it will be seen that we have presented a body of **PRACTICAL, THOROUGH, AND RELIABLE INFORMATION**, such as can nowhere else be obtained for the sum charged for a year's subscription to THE MANUFACTURER AND BUILDER.

Subscription $1.50 per Annum, with Liberal Club Rates and Premiums.

Table of Contents of the First Half-Volume of "The Manufacturer and Builder,"

[*ILLUSTRATED ARTICLES ARE MARKED WITH AN ASTERISK.*]

JANUARY.

*Gold and Stock Telegraphy, ... 1
Persian Arms, Damask Steel, and Damaskeening, ... 2
How to cause a Tempest in a Teapot, ... 2
The Causes of the Difference in the Color of Bricks, ... 3
How to make different Cements, ... 3
Learned Blacksmiths, ... 3
*Dove-Tail Joints, ... 4
Wall-damp, ... 5
The Utilization of Tin Scraps, ... 6
The Firmness of Paper, ... 6
New City Buildings, ... 7
*Have you ever looked through a Microscope? 8
The Mechanic and his Work, ... 8
Reversible Seats, ... 9
Preventive of the Decay of Wood, ... 9
Colorado Manufactures, ... 9
Chemical Engineering, ... 10
The New Art of Fresco-Painting, ... 10
"Old Says" on Building, ... 11
The Progress of Building, ... 11
Chrome-Yellow Paint, ... 11
*Hints for Sign-Painters, ... 12
Imitation-Marble, ... 13
Common Mortar, ... 13
New Paint for Floors, ... 13
Apatite; Its Importance in Domestic Economy, ... 14
Gun-Cotton, ... 14
The Preservation of Wood by Immersion, ... 14
Ventilation and Heating by Currents, ... 15
Cement and Mortar of the Ancients, ... 15
Bridging the Missouri, ... 16
*The Park Bank Building—A Palace of Finance, ... 17
The Air in Lecture and School-Rooms, ... 18
Prize Problems, ... 19
Glass, ... 19
*Improvement in Saws, ... 20
Hoosac Tunnel, ... 21
*Deep-Sea Cables, ... 22
An Important Invention, ... 22
To the Public, ... 22
Trades' Unions in the United States, ... 23
Literary, ... 23
Mechanics' Homes, ... 24
*Long Island Villa, with Mansard Roof, ... 24
*Villa Cornice Work, ... 25
Children's Toys, ... 25
To the Press, ... 26
Occupations and Wages in California, ... 26
Queries, ... 27
Special Notice to Travellers, ... 27
Advertisements, ... 27

FEBRUARY.

*Portable Wainscoting, ... 33
Ventilation and Warming, ... 34
A Few Words about Bricks, ... 35
*The Bessemer Process and its Late Improvements, ... 35
Wire-Rope, ... 37
Hollow Walls, ... 39
Rock-Drilling Machine, ... 39
Mr. Mudge on Woolen Manufactures, ... 39
*Water-Proofing Dress Goods, ... 40
Insoluble Cements, ... 40
Atmospheric Action on Building-Stones, ... 40
*Anatomy of the Screw, ... 41
Lead Pencils, ... 41
Artificial Light and the Subject of Ventilation, ... 42
Architecture and Civilization, ... 43
Arches—Old and New, ... 43
*Manufacture of Sheet Tin, ... 44
Rates of Travel, ... 44
*Hand-Power Machine, ... 45
The History of Windows, ... 45
To Restore Burnt Cast-Steel, ... 45
To Bleach Palm-Oil, ... 45
The Building-Stone and Slate of Virginia, ... 46
The New-York Milling Interest, ... 47
*The New-City Post-Office, ... 48
Review of City Buildings, ... 50
Decay of Wood and Processes for Preserving it, ... 51
The Daguerrean Process, ... 51
To obtain Different Shades of Chrome-Yellow, ... 52
*Improved Cupola and Blower, ... 52
Literary, ... 54
Real Estate for Workingmen, ... 55
The Philosophy of Building, ... 55
*Villa and Cottage Architecture, ... 56
Consumption of Milk, ... 57
Trades and Professions, ... 58
Bread-Making, ... 58
Castle-Garden, ... 58
Queries, ... 59
Special Notice to Travellers, ... 59
Advertisements, ... 59

MARCH.

*Brick-Making, ... 65
Increment and Quality of Bricks, ... 66
Lake Cores—their Nature and Formation, ... 67
*Steam-Dredging and the Suez Canal, ... 68
The Selection of Wall-Paper, ... 71
*Marble Paper Manufacture, ... 71
Sand-Grinding Machine, ... 73
*The Gothic Furnace, ... 74
Ventilation and Heating by Currents, ... 74
*The Ventilation and Warming of School-Houses, ... 75
*Iron Buildings, ... 76
Hints on Economic Building, ... 78
Copper and its Alloys, ... 79
Cryolite—Where found, Nature, and Uses, ... 80
Chrome-Orange, ... 80
*Illinois State Capitol Design, ... 80
The Uses of Gun-Cotton, ... 82
Terra Cotta, ... 82
Building-Stones—Their Preservation, ... 83
*The Vermont Slate Industry, ... 83
Literary, ... 86
"Too Many Irons in the Fire," 87
The Tinning and Silvering of Looking-Glasses, ... 87
*French Sash-Windows, ... 88
*Whence Came our Silks? 88
*Cottage and Villa Architecture, ... 89
What Shall Workingmen Read? 90
The Dwarf Builders, ... 90
Nature as a Builder, ... 91
Sharpening Files by Corrosion, ... 92
Queries, ... 92
Special Notices, ... 92
Advertisements, ... 92

APRIL.

*Improvement in Hand-Drills, ... 97
Renovating Silk Hats, ... 97
Memoranda concerning Nails, ... 98
Comparative Weight of Pattern and Castings, ... 98
Flint-Glass, ... 98
Wolfram or Tungsten Steel, ... 99
Cheap Brick Walls, ... 99
*Stereotyping, ... 99
Edge-Tools, ... 102
Road-Dust and Vegetation, ... 102
Aniline Colors, ... 102
Soap-Making in the Olden Time, ... 103
*Manufacture of Vinegar, ... 104
Textile Fabrics from Glass, ... 104
The Effect of Artificial Light upon the Eyes, ... 105
*The Daguerrean Process, ... 105
Building in California, ... 105
The Piano-Forte, ... 106
The Art of Gilding, ... 106
Ventilation and Warming, ... 107
*Ventilation and Warming of School-Houses, ... 108
*The New-York Fire-Place Heater, ... 109
Cheap Houses—Building on Piré, ... 110
Economic Furniture, ... 111
The Manufacture of Cases for Percussion-Caps, ... 111
*The Thames Embankment, ... 112
*Automatic Indicator for Water and Steam, ... 115
*Winds and Chimney Draughts, ... 115
*Improved Electric Fuse, ... 116
*Stone-Breaking and Ore-Crushing, ... 117
Literary, ... 118
Are Men Equal? 119
Beauty in the Household, ... 119
Coöperation, ... 120
Irish Moss, ... 121
*Cottage and Villa Architecture, ... 121
Public Baths, ... 121
Manufacture of Brushes, ... 122
A Large Building, ... 122
To Clean Glass, ... 122
How to Make the Frasley Cement, ... 122
Polytechnic Association of the American Institute, ... 123
Manufacturer and Builder at $1.50 per year—How it is Done, ... 122
Large Cash Premiums, ... 123
Queries, ... 123

MAY.

*The Telephone, ... 129
Peroxide of Hydrogen for the the Hair, ... 130
The Daguerrean Process, ... 130
Glue, ... 130
How to put a Cross-cut Saw in Order, ... 131
Coraline Dye—Injurious Effects Therefrom, ... 131
Mixing Things Up, ... 131
*On Boiler Explosions, ... 132
How to Repair Chain Pumps, ... 134
New Element, ... 134
*Béton Building, ... 135
Hydraulic Mortar, ... 135
Shellac for Water-Proof Coatings, Dyes, Paints, and Printing Inks, ... 135
*Improvement in Billiard Tables, ... 137
Historical Notes on Paper Manufacture, ... 137
Kalsomining Walls, ... 138
A Plea for Stone, ... 138
On Forging, Hardening, and Tempering Mill-Picks, ... 139
Chrome-Yellow Paint Practically Tested, ... 138
*Water-Closets, ... 140
Welding Copper, ... 140
The Largest Suspension Bridge, 140
*Improved Hoisting Apparatus, .141
Colored Marbles, ... 141
The Piano-Forte, ... 142
Thames Embankment—South Side, ... 142
Seaweed Charcoal, ... 142
Ventilation and Warming, ... 143
The New Metal Hydrogenium, .141
Painting Zinc, ... 141
Artificial Alizarine for Coloring, 144
Prisoian a little Scratched, ... 144
Suez Canal, ... 144
*The New State Emigrant Hospital, Ward's Island, ... 145
Magenta, ... 145
Varnishes for Iron, ... 147
Ornamental Glass—Opaline and Enamel, ... 147
Ship-Building—Here and in England, ... 147
Industrial Progress, ... 147
A New Ornamental Wood, ... 148
Sprinkling Streets with Deliquescent Salts, ... 148
*Old and New Fire-Grates, ... 148
Effect of Cold upon Tin, ... 148
Cryolite as a Source of Soda, ... 149
Literary, ... 150
Credit, ... 151
On Going Surety, ... 151
Interior Decorations, ... 151
*Church Architecture, ... 152
*Ornamental Work—Ceiling and Railing, ... 153
Purifying Water, ... 154
Adulterations, ... 154
Indelible Inks, ... 154
New Cements, ... 154
Welding Steel to Iron, ... 154
Queries, ... 155
New Advertisements, etc., ... 156

JUNE.

*Improved Steam Pump, ... 161
What Paint shall we use? 162
Varnishes—their Nature and Manufacture, ... 162
Something of practical Importance in the Use of Plaster-of-Paris, ... 163
Influence of Water in the Manufacture of Wax-Leather, ... 163
Why do we Oil our Whetstones? .163
Compressed Leather, ... 163
*The Art of Electrotyping, ... 164
Practical Hints on Working and Tempering Steel, ... 166
Spiritual Photographs, ... 167
"Too Much Pork for a Shilling," 167
Credit to whom Credit, etc., ... 167
Store-Shutters, ... 167
Damp Cellars, ... 167
The Velocipede as a Mechanical Agent, ... 168
Calculating Areas by Weight, ... 168
Aniline Gray, ... 168
The Generation of Oxygen Gas from Sulphuric Acid, ... 168
*On Testing Iron by Magnetism, 169
Blowing a Wine-Glass, ... 170
Horse-Jewelry is Made, ... 170
Uses of Wheels, ... 170
Varnishing or Painting, ... 171
The Manufacture of Cards, ... 171
Right-Handand Left-Hand Locks 171
Lisieux and its Linen Factories, 171
Cleaning Gilded Ware, ... 171
Encaustic Tiles, ... 172
*Salt—its Manufacture and Uses, 172
Paper Belting, ... 173
Vegetable Oils—their Production and Purification, ... 174
Chimneys and Chimney-Shafts, .174
Artificial Stone, ... 174
Plank Walls for Cottages, ... 175
New Fact in the Behavior of Iron, ... 175
Science and Art, ... 175
*The Kansas City Bridge, ... 176
Cement to resist Red Heat and Boiling Water, ... 178
Recovery of Fatty Matter from Waste Soap-Waters, ... 179
Paper Houses, ... 177
Sodium as a Substitute for Phosphorus in Lucifer Matches, ... 179
A Plea for Iron, ... 179
To Keep Nails from Rusting, ... 179
*Wrought-Iron Arch Girder Bridge, ... 180
Liquid Fuel, ... 181
New Mode of Breaking Masses of Iron, ... 181
Utilization of Street Dust, ... 181
Literary, ... 182
How to Spoil a Husband, ... 183
Chess, ... 183
A New Alloy, ... 184
A Country or Suburban Barn, .. 184
Good Material for Bonnets, ... 185
Design for a Summer House, ... 185
Workingmen as Students, ... 185
Eating, ... 185
The Philosophy of a Candle, ... 186
Adulterations, ... 187
Recipes for Earthern-Ware Glazing, ... 187
Hemp, ... 187
A Poor Prospect for the Year 1900, ... 187
Setting Fence-Posts, ... 187
Queries, ... 187
New Advertisements, ... 188

The above speaks for itself. In a period of six months we gave upwards of **500 COLUMNS OF MATTER,** from the pens of the best writers in the country and presented in connection therewith upwards of **150 ENGRAVINGS!** The second half volume is equal to the first half in every respect, and it is our determination, during **1870,** to even surpass all our former efforts and make the MANUFACTURER AND BUILDER **INDISPENSABLE** to every

MECHANIC, ARCHITECT, BUILDER, ENGINEER, CARPENTER, MACHINIST, AND LABORING MAN IN THE COUNTRY.

VOLUME ONE, BOUND

In Cloth, with Gold Mountings, can be had after Dec. 15th. Price $2.25. Send in your orders at once. Those received in advance will be filled first.

Address,

WESTERN & COMPANY, Publishers,

NO. 37 PARK ROW, NEW YORK.

MACHINISTS' SUPPLIES.

LECOUNT'S PATENT HOLLOW LATHE DOGS AND CLAMPS.—A set of eight Dogs from ⅜ to 2-in., inclusive, $8. A set of twelve from ⅜ to 4-in., $17 30. Five sizes Machinists' Clamps, from 2 to 6-in., inclusive, $11. Send for Circular. C. W. LECOUNT, N 2:1y South Norwalk, Conn.

THE CHALMERS-SPENCE PATENT NON-CONDUCTOR FOR COVERING BOILERS ETC.

Also for protecting Water Pipes and Mains from FROST. This Composition is NON-COMBUSTIBLE. It never DETERIORATES, and will last as long as the boiler or pipe to which it is applied. It SAVES from 20 TO 30 PER CENT. in fuel according to circumstances. This has been practically demonstrated. Steam passes through ANY LENGTH of piping covered with this Composition QUITE DRY.

Extensively used in the British Navy and by the leading Manufacturers, Shipbuilders, and Steamship Companies of Great Britain and the Continent; and since its introduction in America it has given universal satisfaction. In witness whereof see pamphlet containing names and testimonials, to be had by applying to the only manufacturers in this country,

THE CHALMERS & SPENCE NON-CONDUCTOR CO., Foot of East Ninth street, New York.

Or, to E. H. Ashcroft, Boston, Agent for New England; L. M. Hart, 522 Walnut street, Philadelphia; F. A. Shuck, 34 Peter's street, New Orleans; J. Kupferle & Co. St. Louis, Mo. nov. 30-3m

NEW YORK BELTING AND PACKING COMPANY. The oldest and largest manufacturers in the United States of

Vulcanized Rubber Fabrics,

Adapted to Mechanical Purposes,

I nvite the attention of all who are interested in the sale or use of such articles to the high standard quality and low prices of their various manufactures, comprising

Machine Belting, Steam Packing, Leading Hose, Suction Hose, Car Springs, Wagon Springs, Billiard Cushions, Grain Drill Tubes,

etc., etc., etc.,

"TEST" HOSE

made expressly for the use of Steam Fire Engines, and will stand a pressure of 400 pounds per square inch. Officers of Fire Departments requiring new hose, will find this much superior in strength and quality to any other.

PATENT SOLID EMERY VULCANITE WHEELS, a composition of rubber and emery, making a very hard uniform substance of the nature of stone throughout. These wheels for grinding and polishing metals, "gumming" saws, etc., are the most economical and effective tools that can be used.

WAREHOUSE, 37 AND 38 PARK ROW, NEW YORK.

JOHN H. CHEEVER, Treasurer.

☞Price lists and further information may be obtained by mail or otherwise on application. oct30-1y-os

WOOD, LIGHT & CO.,

Manufacturers of

IMPROVED LATHES,

FOR TURNING SHAFTING.

IMPROVED COUPLING BOX,

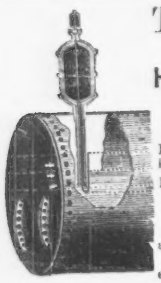
with Locks on Shaft for connecting Shafting; and

IMPROVED BOLT CUTTER.

Persons purchasing Shafting, or engaged in its manufacture, or having use for a Bolt-Cutter, should examine these improvements, before purchasing elsewhere.

☞Warehouse, 107 Liberty Street, New York City.

☞Manufactory, Junction Shop, Worcester, Mass. april24-1y-q



THE LAST AND THE BEST!

MASSEY'S

High & Low Water Detector.

Patented in the United States, England and France. Is perfect in simple and reliable instrument FOR PREVENTING EXPLOSION OR BURNING OF STEAM BOILERS.

PRICES, $25, $30, $35, and $40, according to finish.

Every instrument warranted in every respect.

This Detector requires no adjusting after being applied to the Boiler, and

CANNOT BE TAMPERED WITH.

It may be applied on top, or in a separate chamber, at the end of the Boiler. Address,

J. W. BLAKE & CO., General Agents,

Dec. 7:3m 389 Broadway, New York.

ADOLPH OTT,

CHEMICAL ENGINEER,

May be employed professionally as an expert on practical subjects, involving both Chemical and Mechanical knowledge. A specialist in various branches of Technology. Assays and Analyses of all kinds. Address, Editorial Rooms of the "Engineering and Mining Journal," 37 Park Row, New York City.

☞Written communications preferred. nov28-tf

LUCIUS W. POND'S NEW TOOLS.

NEW AND IMPROVED PATTERNS—Lathes, Planers, Drills, Milling Machines, Boring Mills, Gear and Bolt Cutters, Punches and Shears for Iron. Dealer in

IRON & WOOD WORKING MACHINERY

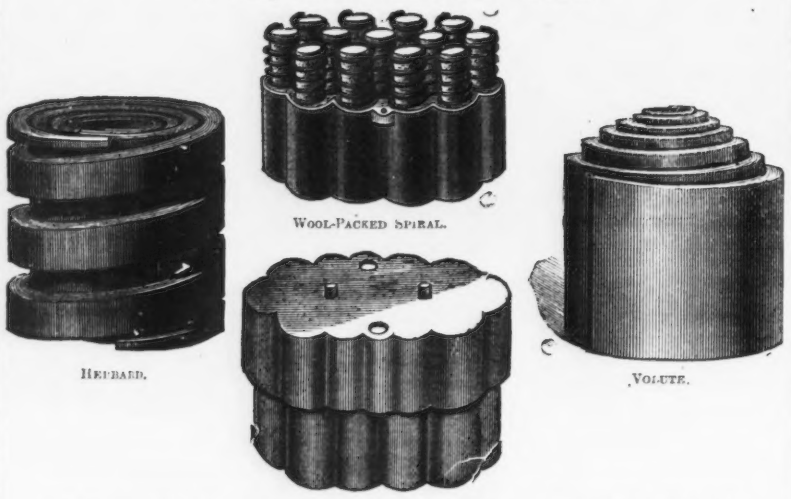
☞Works at Worcester, Mass. Office, 98 Liberty St., ew York.

aug4-1y-os S. N. HARTWELL, General Agent.

CAR SPRINGS.

UNION CAR SPRING MANUFACTURING CO.,

4 Dey Street, New York.



BEST BEARING AND BUFFER SPRINGS AT LOWEST PRICES.

SEND FOR ILLUSTRATED PAMPHLET.

F. W. RHINELANDER, President. S. VERNON MANN, Treasurer. LEAVITT HUNT, General Agent.

Dec.2:6m

MACHINISTS' SUPPLIES.

PROVIDENCE TOOL COMPANY,

PROVIDENCE, R. I. [*Established* 1845.]

Manufacturers of Nuts and Washers, Bolts, Chain Links, Pick Axes, Can Rings, Plate Hinges, Threshing-Machine Teeth, Hooks and Thimbles, Clinch Rings, Connecting Shackles, Ship Scrapers, Marlin Spikes, &c., &c. Police Hand-Cuffs and Ankle Shackles, Cast Steel Hammers.

NEW YORK WAREHOUSE, 29 BEEKMAN STREET.

H. B. NEWHALL, Agent.

Sept 28:tfq

ENGINEERS' SUPPLIES.

Leschot's Patent DIAMOND-POINTED STEAM DRILLS.

adapted to every variety of ROCK-DRILLING. The unequalled efficiency and economy of these Drills are now acknowledged both in this country and Europe. The reputation which they acquired at the Mont Cenis Tunnel, has been sustained by their complete success in the mines and quarries of this country. These Drills are built of various sizes and patterns, both with and without boilers, and bore from one to six (1 to 6) holes at a time, at a uniform rate, per hole, of three to five (3 to 5) inches per minute in hard rock; eight to ten (8 to 10) inches per minute in slate; and sixteen to twenty-two (16 to 22) inches per minute in coal. They are adapted to Channelling, Gadding, Shafting, Tunneling, and open cut work; also to deep boring for testing the value of mines and quarries. TEST CORES, in the form of solid cylinders of rock or mineral, are taken out by the "Prospecting Drill," showing the character of mines at any depth. Used either with steam or compressed air. Simple and durable in construction. Never need sharpening, as the points (*composed of rough uncut diamonds*) are practically indestructible. More than two thousand feet can be drilled in hard rock with same points, with out repair. Manufactured by

SEVERANCE & HOLT,

aug'1-1y Office, 16 Wall St., New York.

WIRE ROPE

MANUFACTURED BY

JOHN A. ROEBLING'S SONS,

TRENTON, N. J.

FOR

Inclined Planes, Mining,
Standing Ship Rigging,
Suspension Bridges, Ferries,
Stays and Guys on Bridges,
Cranes and Shears,
Derricks, Tillers, etc.

A large stock of Wire Rope constantly on hand. Orders filled with dispatch.

☞For strength, size, and cost, see circular, which will be sent on application. dec26-tf

STEAM ENGINES

FROM 4 TO 500 HORSE-POWER,

Including CORLISS PATENT CUT-OFF ENGINES, SLIDE VALVE STATIONERY ENGINES, and PORTABLE ENGINES. Also, IMPROVED CIRCULAR SAW MILLS, etc.

Send for Descriptive Circular and Price List.

WOOD & MANN STEAM ENGINE CO., UTICA N. Y.

Warerooms, 42 Cortlandt Street, New York; and 201 and 203 South Water Street, Chicago, Ill. nov7-1y-os

GUN-POWDER

THE LAFLIN & RAND POWDER CO., 170 BROADWAY, NEW YORK, deliver Mining, Blasting, and Sporting Powder, from their Agencies in all parts of the United States, and their Works at Kingston, Newburg, Saugerties, and Catskill, N. Y., Pottsville, Carbondale, and Scranton, Pa., Baltimore, Md., and Platteville, Wis.

☞Safety Fuse at Wholesale. nov 2:1y

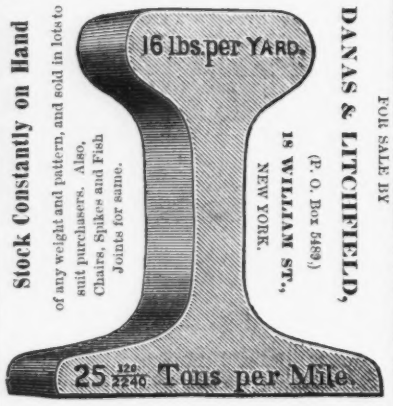
ENGINEERS' SUPPLIES.

B. F. STURTEVANT'S NEW PATENT IMPROVED FAN AND PRESSURE BLOWERS

MANUFACTORY & SALESROOM 72 SUDBURY ST. BOSTON.

feb13-1y-os

RAILROAD IRON FOR MINES.



Stock Constantly on Hand of any weight and pattern, and sold in lots to suit purchasers. Also, Chairs, Spikes and Fish Joints for same.

DANAS & LITCHFIELD, 18 WILLIAM ST., NEW YORK.

(P. O. Box 5489.)

FOR SALE.

Light Locomotives, for use in Collieries, Mines, etc. mch13-6m

HEBBARD CAR SPRING CO., Manufacturers of Patent Right and Left Spiral

Steel Car Springs.

M. B. WASHBURN,

General Agent,

137 and 141 Elm Street, New York City.

jan23-1y-isq

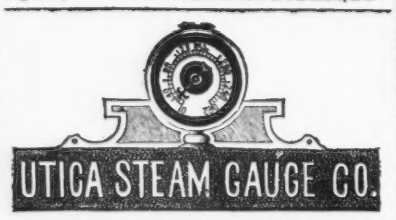
GUNPOWDER PILE-DRIVER—THOMAS SHAW PATENT.—The Company are prepared to sell rights, or machines, or will contract for driving piles quicker and better than it can be done by any other machine.

Fifty Blows Per Minute and no Crushing or Shattering.

For description and illustration see this Journal of August 17th, Vol 8, No. 7. Address

GUNPOWDER PILE-DRIVER,

aug 21-1y o. Nos. 565 Minor street, Philadelphia.



UTICA STEAM GAUGE CO.

MANUFACTURERS OF

STEAM VACUUM AND WATER GAUGES,

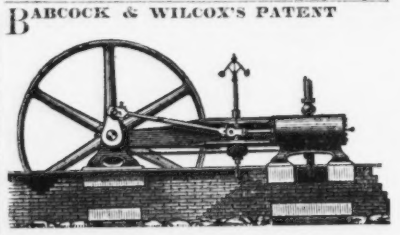
BOILER FEEDERS AND ENGINE ROOM FIXTURES.

No. 8 CORNELIA Street, Utica, N. Y.

☞Send for Circular. sep6-6m

ENGINEERS' SUPPLIES.

BABCOCK & WILCOX'S PATENT



STATIONARY STEAM ENGINES,

Received the FIRST PREMIUM at the FAIR OF THE AMERICAN INSTITUTE, 1869, for the MOST PERFECT AUTOMATIC EXPANSION VALVE GEAR, in competition with the Corliss and other engines.

They are unequalled for

ECONOMY OF FUEL, REGULARITY OF SPEED, AND SIMPLICITY OF MECHANISM.

BABCOCK & WILCOX'S PATENT TUBULOUS BOILER is superior to all others in

ECONOMY, EFFICIENCY, DURABILITY, AND SAFETY.

Send for Circular,

BABCOCK, WILCOX & CO.,

sep7-1y os No. 44 CORTLANDT STREET, New York.

MISCELLANEOUS.

FIRE-BRICK. TRADE MARK.

U. S. Government Standard. Manufactured exclusively by the

Consolidation Coal Company of Maryland

For Blast, Puddling, Smelting, and Glass Furnaces, and all other purposes requiring the best quality. Diagrams of shapes, and prices will be furnished by the undersigned. Also,

George's Creek Cumberland Coal

by the cargo from the Company's

OCEAN MINES.

C. H. DALTON, Pres., 4 Pemberton Sq., Boston. | J. S. MACKIE, 2d Pres., 71 Broadway, New York.

JAMES A. MILLHOLLAND, 2d V. Pres., Mount Savage, Maryland.

GILMOR MEREDITH, 25 South Gay street, Baltimore.

Dec. 7:tf

MINNESOTA AS IT IS, IN 1869.

Just published, 300 pages, 12 mo., with a colored map of the State, handsome engravings, official descriptions by Geologists, Topographical Engineers, and others, of the SOIL, CLIMATE, MINERAL REGIONS, AGRICULTURAL RESOURCES, SCENERY, Population, Nationality, Railroads, Pineries, and general ATTRACTIONS OF THE STATE FOR FARMERS, MECHANICS, INVALIDS, TOURISTS, CAPITALISTS, and BUSINESS MEN, with special descriptions of EVERY TOWN AND COUNTY where the Government Lands lie; Laws and Methods of Homestead and Pre-emption Claims; Sketches of INDIAN LIFE, CUSTOMS, RELIGIOUS NOTIONS and MISSIONS; Schools, Churches, and Social Life of the State; how to use Money to advantage; all about BRITISH AMERICA, WINNIPEG, and THE SEAT OF THE REBELLION, and EVERY SUBJECT OF INTEREST TO THOSE LOOKING WESTWARD.

Price of Book and Maps, cloth binding, $2 25; paper, $1 75; without map 50 cents less. Sent by mail on receipt of price. J. W. McCLUNG,

Jan 4-tf o.s St. Paul, Minn.

E. ALLEN & CO.'S

NEW MODEL Cartridge Revolver.

Weight only 6 oz. can be carried in the vest pocket. Seven Shots, 22-100 cal. Lightest and best Revolver in the world.

Address ETHAN ALLEN & Co.,

Jan 4-6m o.s Worcester, Mass.

RIGGS' BELMONTYLE OIL, 150 Front Street, New York.

PREVENTS Rust, Tarnish, &c

Send for Circular to H. B. RIGGS,

Dec 21-8t o.s.

Copper Ore For Sale.

The undersigned would obligate himself to furnish from Thirty to Fifty Tons per week, or if preferred, would sell the farm containing the mine.

For further particulars, address

THOMAS BROWN,

1t No. 333 Coates street, Philadelphia, Pa.

THE ENTIRE SOAPSTONE QUARRY,

MILLS, SAWS, TOOLS, AND MACHINERY IN

GROTON, MASS.

Will be sold at PUBLIC AUCTION on March 10th, at 2 o clock, P. M. Send for part culars to

J. F. WOOD,

Feb. 15:4t 32 Pemberton Square, Boston, Mass.

MAGIC LANTERNS FOR SUNDAY Schools, Academies, Public Exhibitions, and Parlor Entertainments. Illustrated priced catalogues sent free. T. H. McALLISTER, Optician,

Dec 21.6m 49 Nassau street, N. Y.

MICROSCOPES FOR SCIENTIFIC INVESTIGATIONS and Educational Purposes. Price list sent free. T. H. McALLISTER, Optician.

Dec 21-6m 49 Nassau street, N. Y.

CIRCULAR SAW MILLS, PLANERS, MATCHERS, ETC. Prices Low.

J. HEALD & SON, Barre, Mass., Iron Founders and Machinists, make the

LARGEST AND BEST PLANER

to be found for the money. Send for Circulars.

Dec. 7:3m

FOR SALE—A FIRST-CLASS 10-STAMP MILL. California pattern, with twenty-five horse-power engine and thirty horse-power boiler, new and in good condition. For particulars and terms, address "STAMP-MILL," care of the ENGINEERING AND MINING JOURNAL. nov. 9:tf. o.s.